COAL AGE

Volume 14 New York, October 10, 1918 Number 15

Hun Propaganda

By Floyd W. Parsons

Recently the *New York Evening World* launched a virulent attack on the coal industry and the United States Fuel Administration. The articles, featured on the front page and written by a woman unfamiliar with coal mining, attempted to deal with subjects that have occupied the attention of experienced mining engineers for many years.

The campaign was disloyal and malicious. Not only were the articles filled with inaccuracies, but the whole attack was based on a false premise. The chief effort of the paper was to convince the public that utilization of the culm banks in the anthracite field offered a solution to the coal problem in New York.

Evidently no effort was made to discover the true facts in the situation. If the *Evening World* had desired to be fair, it could easily have learned that anthracite culm cannot be burned in the average furnace unless it is first mixed with from one to two times the same quantity of bituminous coal. It could have found on slight investigation that months are required to change the common style of furnace to burn these low-grade mixtures of fine coal. And it certainly knows that even if such a change were advisable, the necessary equipment could not now be obtained.

It would have been easy for the author of the articles to have procured correct information from Dr. Garfield, for he has detailed reports on the entire culm situation made by responsible and independent Government officials months ago. The contents of these reports would have been available to anyone seeking to tell the truth. But the paper desired to appear in the rôle of one discovering a great idea, whereas the story is ancient to everyone who knows anything about fuel.

The *Evening World* has stooped to the lowest form of yellow journalism. The efforts of mining men to call the attention of the editors of the newspaper to the mistakes in the articles were met with insolence. Carefully prepared statements sent them were ignored. And still this paper boasts its loyalty, while at the same time it walks hand-in-hand with a writer who refuses facts and advocates a plan that would cause untold suffering if followed.

Last winter the whole nation cried out against the shipment of dirty coal. Now we have among us a paper that advocates the use of our railroad cars to transport a product that is 50 per cent. rock. The hard-coal operators are charged with being conspirators because they insist on loading only the cleanest kind of coal in every car they can get. Dr. Garfield has an active department in his organization that is charged with seeing that no shipments of fuel are made which contain an undue percentage of ash.

The *Evening World* wants all of this set aside. It demands that miners be taken from the chambers in the mines where they are producing real fuel and be employed in shoveling and hauling a waste product that won't burn until it is washed and mixed with true coal. It demands that the small mine cars, already too scarce, be set to hauling this mine waste, and that power, and time and material be employed in such service instead of being utilized effectively in actual mining operations.

When an organ such as the *Evening World* seeks to be sensational through the perversion of facts in times of peace, it deserves to lose the respect of decent people. But in these days of great trial, when the sons of our miners, mine managers and fuel administrators are shedding their blood and doing their full share in France, the paper that willingly lends itself to the selfish interests of a few disgruntled culm-bank profiteers is consciously or unconsciously rendering direct service to the evil master of the Huns. The editors who print such vicious propaganda without careful investigation are no better friends of the cause of Liberty than the paid soldiers of the Emperor of Germany.

IDEAS AND SUGGESTIONS

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2. Homemade spacious grease cup.
3. Pipe fitting simplifies shaft leveling.
4. Unique valve seat remover.

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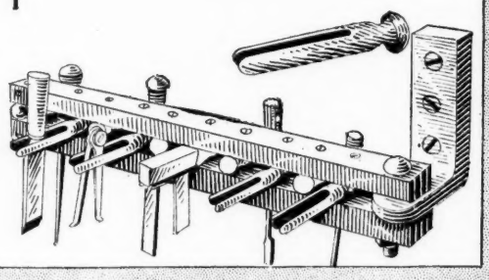

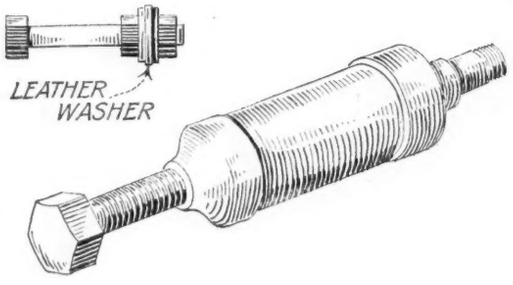

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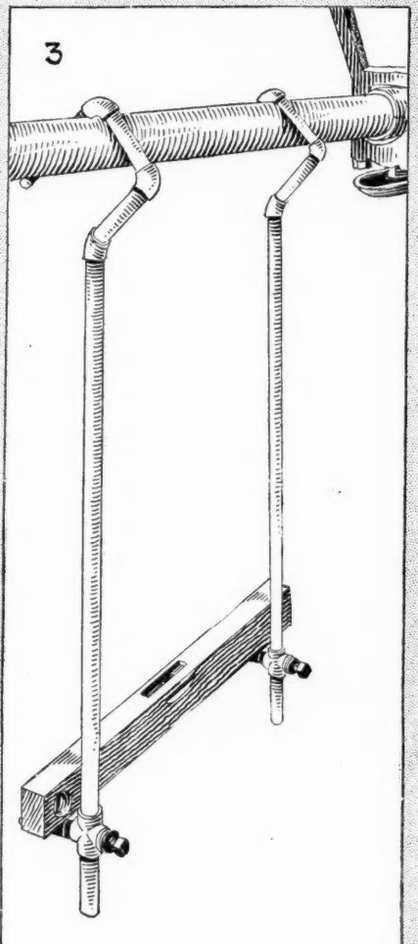

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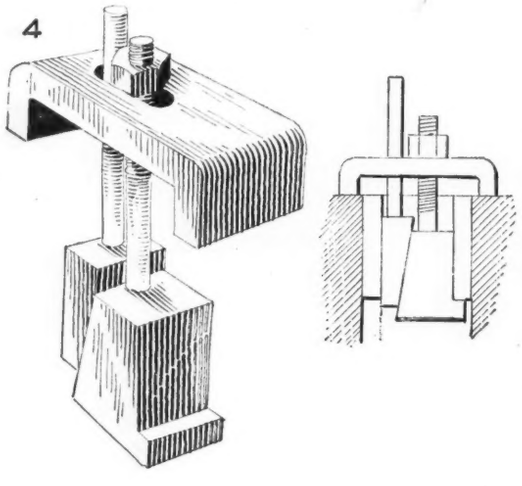
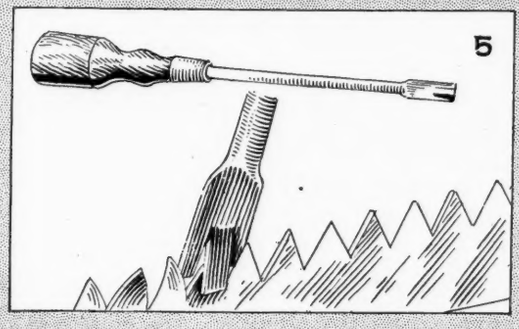
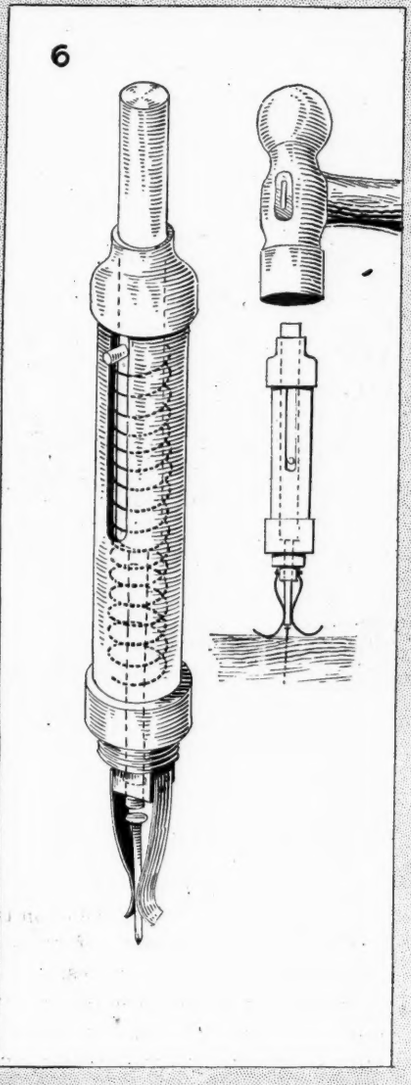
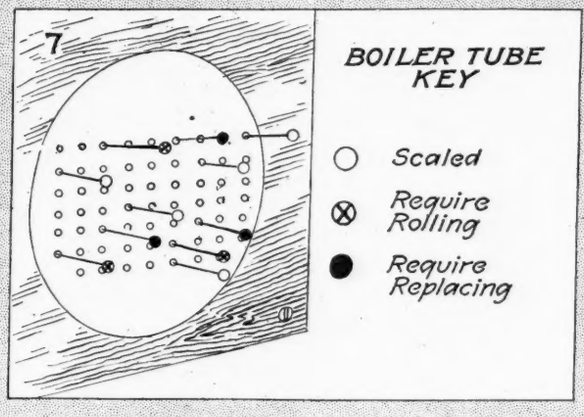


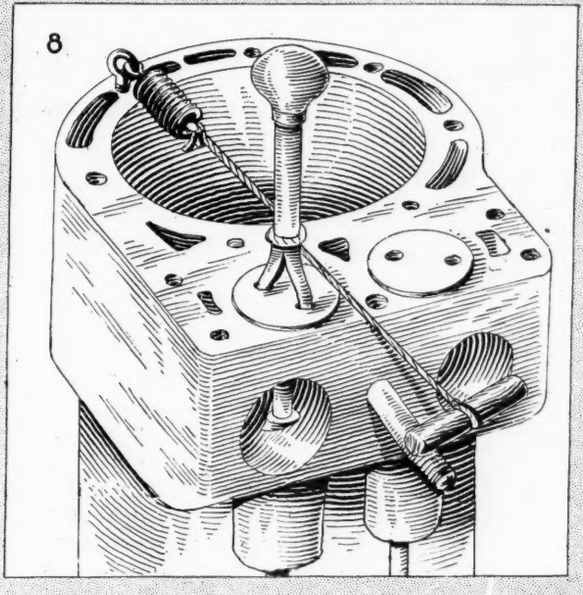
KINKS FOR USE AROUND THE MINE



5. Screw driver also serves as a saw set.
6. How to drive nails in inaccessible places.
7. Colored pinheads indicate condition of boiler tubes.
8. Makes valve grinding an easy job.







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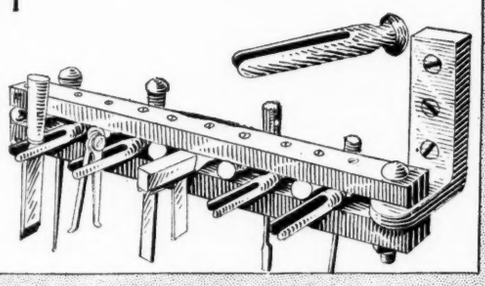

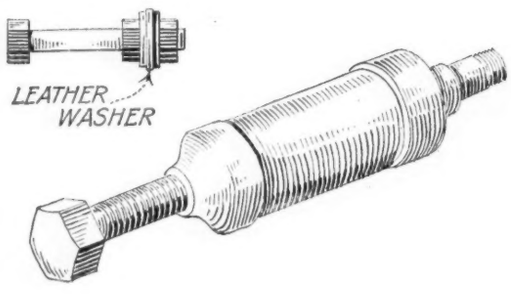

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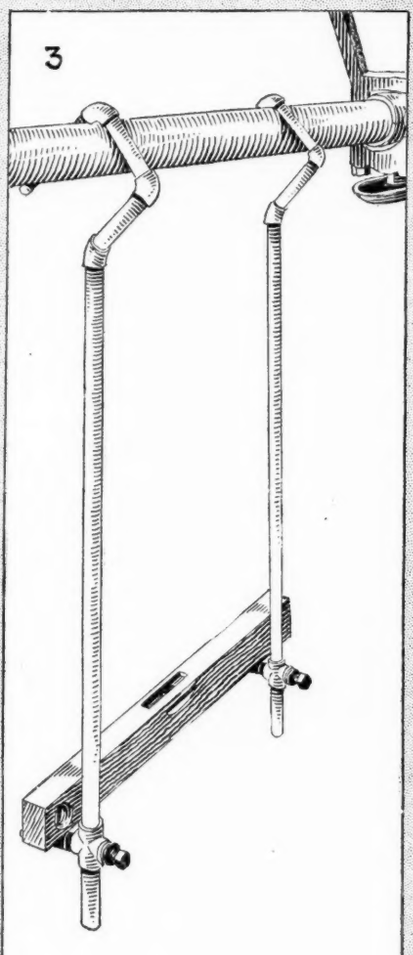

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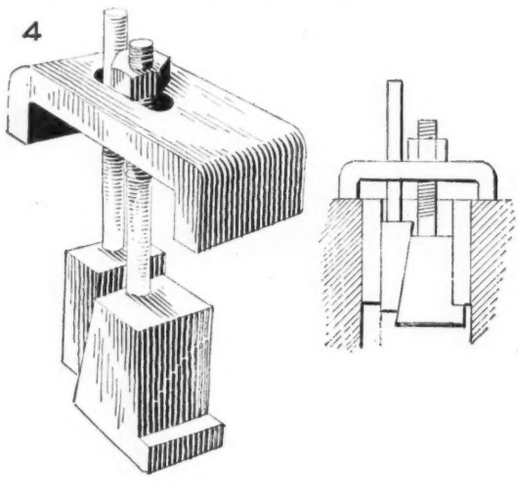

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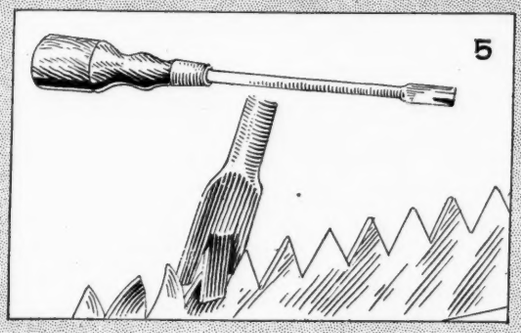

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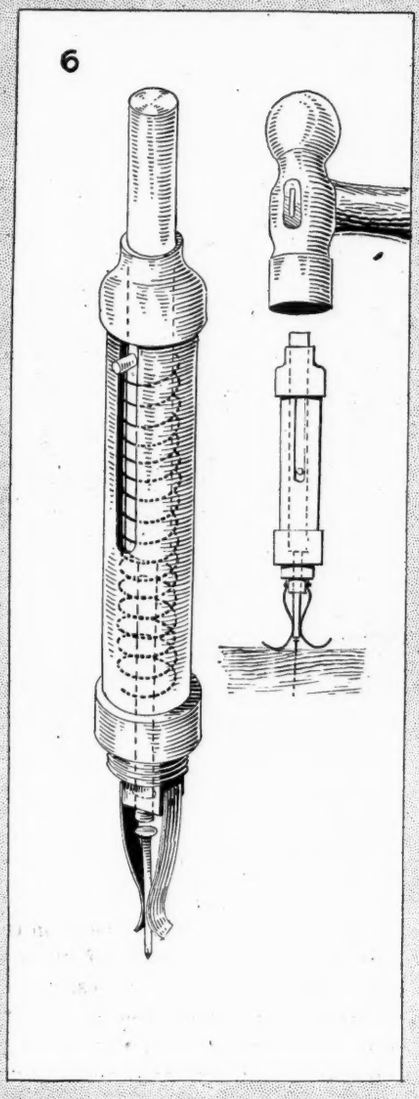
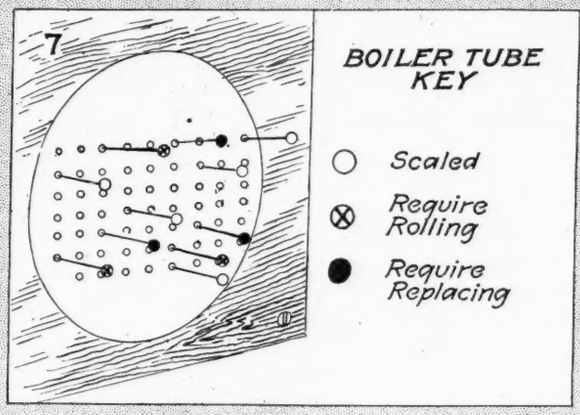
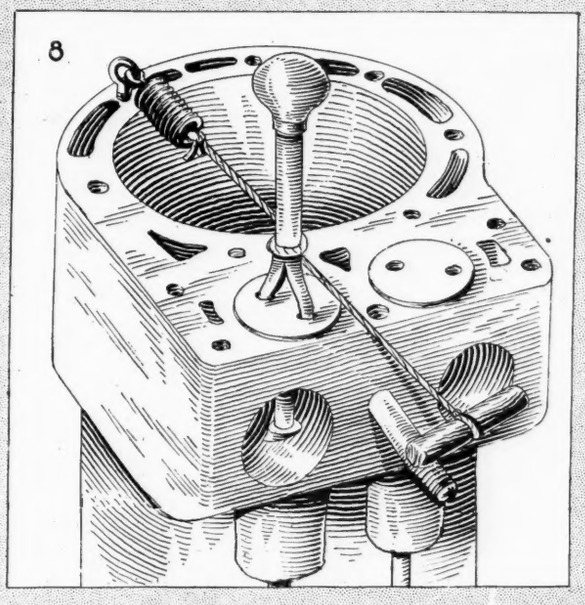






Raising Steam With the Waste Products of Yesterday

Silt, Formerly Considered a Nuisance, As It Meant a Disposal Problem to the Operator and Pollution to the Streams of the Farmer, Is Today a Valuable Asset—Burned on a Special Grate It Supplants More Essential Fuel

THE old culm banks in the anthracite region are fast disappearing. The washery is redoubling its efforts, and the products from this method of preparation tend in large measure to force anthracite shipments above previous records. Up to within a quarter of a century ago, the culm banks rapidly increased in size; but since that time a movement to utilize this waste has steadily gained favor, and within a short time these old landmarks likely will have completely disappeared.

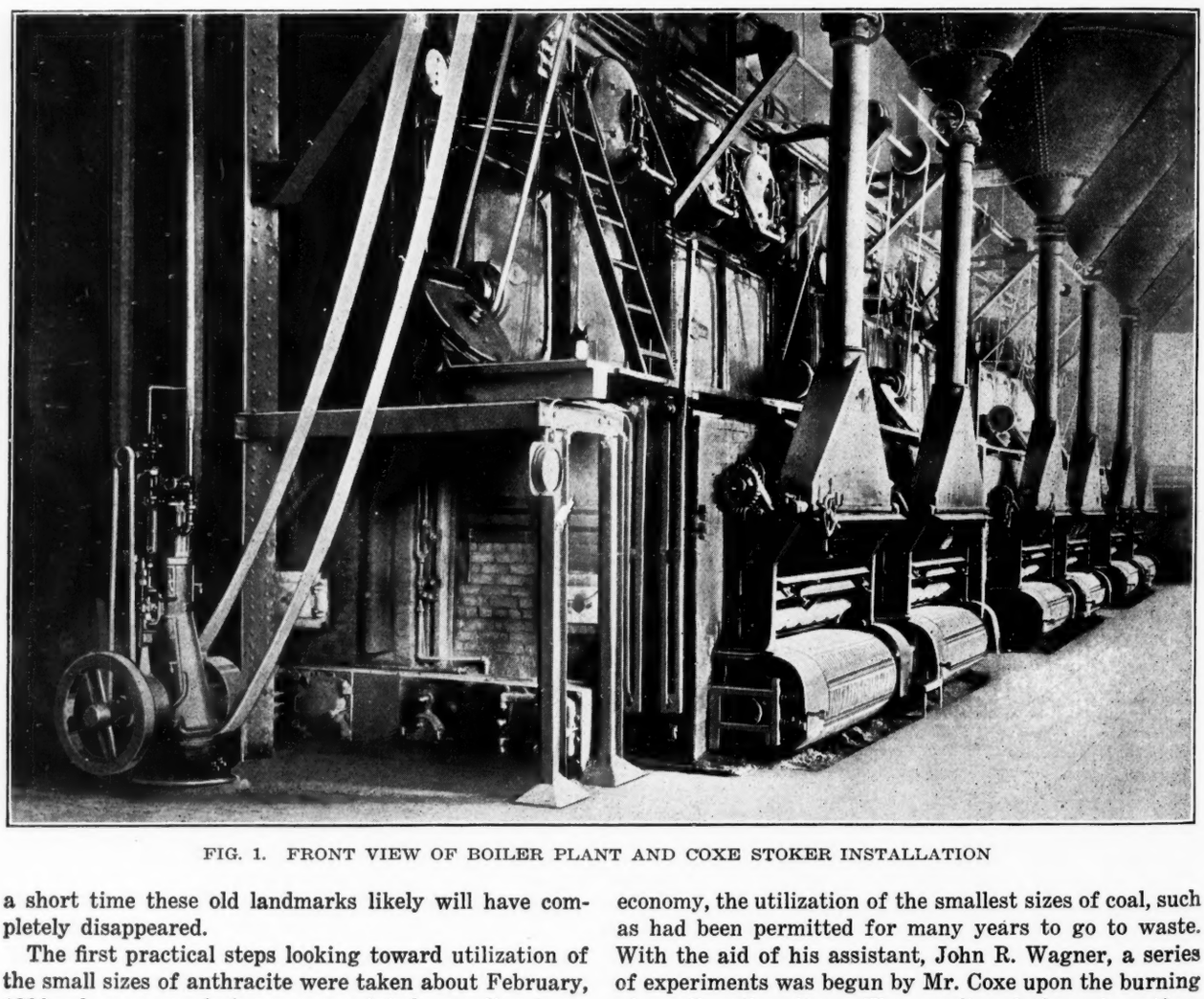


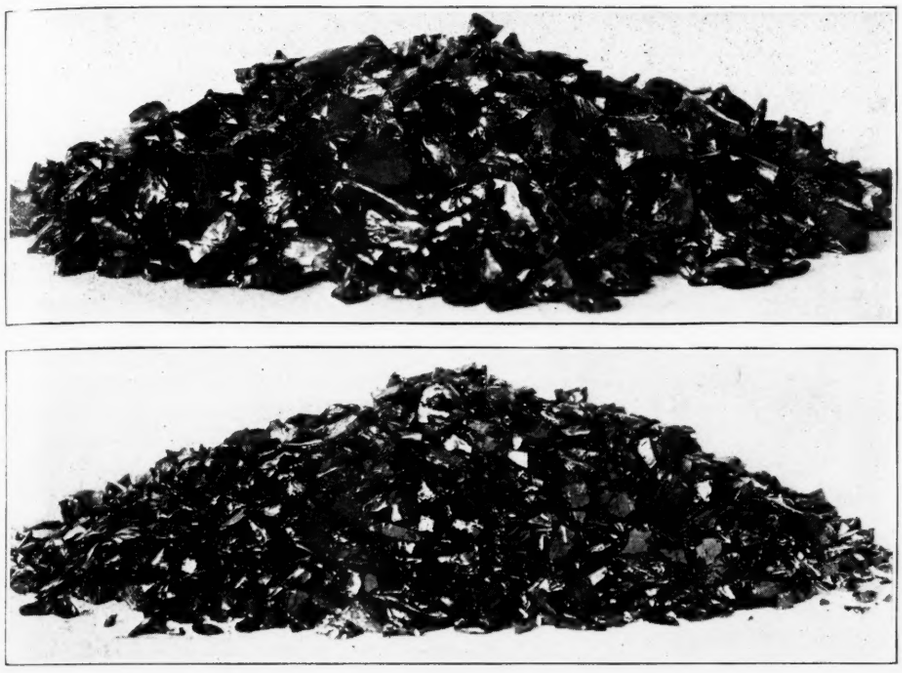
FIG. 1. FRONT VIEW OF BOILER PLANT AND COXE STOKER INSTALLATION

The first practical steps looking toward utilization of the small sizes of anthracite were taken about February, 1890, when a commission was appointed according to an act of the legislature of Pennsylvania. It was the purpose of this commission to investigate the waste of coal mining, with a view to the utilization of such waste. The results of this investigation were reported in May, 1893.

An active member of this commission was the late Eckley B. Coxe, probably the leading mining engineer of his time. Mr. Coxe was the most prominent figure in the management of Coxe Brothers & Co.'s extensive anthracite interests in the Hazelton region of Pennsylvania. He was especially well equipped by temperament, training and facilities at his command to attain results along the lines noted.

Mr. Coxe's study of the subject led him to select as the most important of all the practicable measures of economy, the utilization of the smallest sizes of coal, such as had been permitted for many years to go to waste. With the aid of his assistant, John R. Wagner, a series of experiments was begun by Mr. Coxe upon the burning of small anthracites. The results of these investigations were published in the "Transactions" of the American Institute of Mining Engineers,[1] from which the following is quoted: "Having determined in a general way what seemed to me the proper conditions for

[1]Vol. 22, p. 581.—A paper entitled, "A Furnace with Automatic Stoker, Traveling Grate and Variable Blast Intended Especially for Burning Small Anthracite Coal," by Eckley B. Coxe.



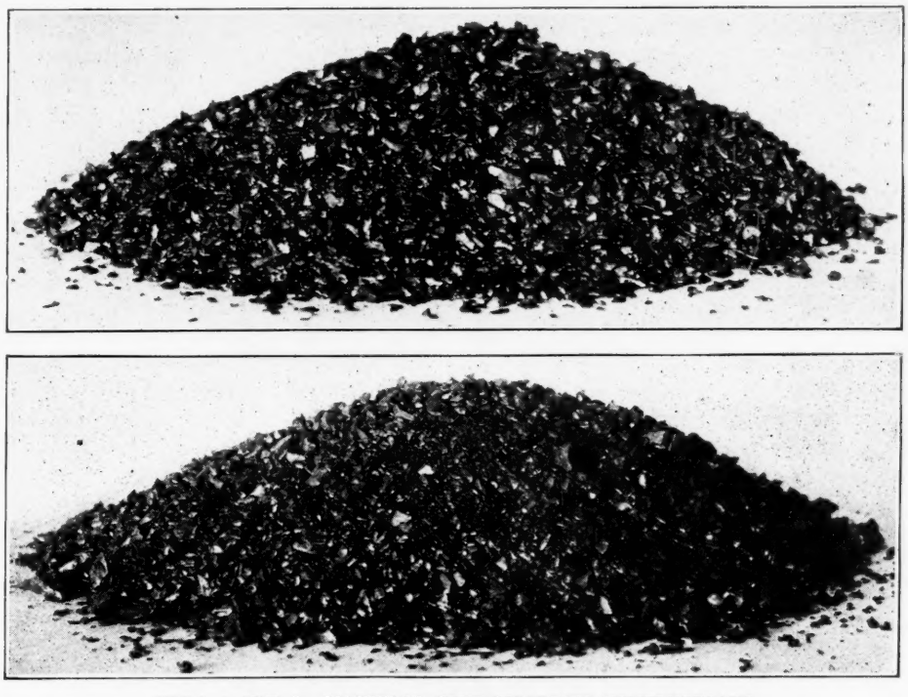
FIGS. 2 AND 3. NATURAL SIZE BOILER FUEL
Fig. 2 (Top)—No. 2 buckwheat (or rice). Fig. 3 (Bottom)—No. 3 buckwheat (or barley)

burning small anthracite economically, I [E. B. Coxe] started to design a furnace which would, as far as possible, fulfill the required conditions, which were: (1) To ignite the coal and burn it up without mixing it with fresh fuel; that is, that fresh fuel would not be added to the already partially consumed coal. (2) To have the furnace so arranged that the combustion would be continuous and uniform; that is to say, that when the furnace was in use the condition of the fire would be practically the same at any hour of any day of any week of the year. (3) To make the work of firing as easy as possible, so that a minimum number of firemen would be employed and that the whole operation of the furnace would be controlled by an intelligent man who would have more use for his brains than for his muscles; the idea being that in a large and complete plant the coal would be brought from the source of supply by elevators or drags and be fed to the furnace without hand labor, and that the ashes would be dumped into a pocket where they could be easily loaded into cars in the same way. No pokers, slice bars or other similar tools should be needed."

In order to meet the foregoing conditions, Mr. Coxe designed and built the first Coxe traveling grate and mechanical stoking furnace, and in 1893 he completely equipped his Oneida colliery with this device. It is stated that the original stokers are still in constant operation in connection with Stirling boilers. It is interesting to note the results of a test made at the completion of this boiler plant. In a continuous test extending over a period of one week, an evaporation of 8.6 lb. of water from and at 212 deg. F. per pound of dry coal was made at 4.2 per cent. over the rated capacity of the boilers. The coal burned was No. 2 buckwheat (rice) containing 5.45 per cent. volatile, 15.5 per cent. ash and 76.95 per cent. fixed carbon.

Unfortunately for the mining industry, Mr. Coxe died in May, 1895. As he had been the designer of the grate bearing his name, and the prime mover in its development, with his death his improvements automatically ceased. In 1903 the holdings of Coxe Brothers & Co., which included the Drifton shops, were taken over by the Lehigh Valley Coal Company.

A brief review of the steps leading to the working out of a practical furnace for burning small anthracite coal is not only interesting but essential to a proper understanding of the situation. The Coxe traveling grate, as first used, would burn efficiently No. 1 buckwheat and rice (previous to 1893 these sizes were considered waste products), but it was not designed to



FIGS. 4 AND 5. NATURAL SIZE SMALLER BUCKWHEATS
Fig. 4 (Top)—No. 4 buckwheat (or bird's-eye). Fig. 5 (Bottom)—Mixture, mostly silt with small amount of No. 4 buckwheat. Fuel used by Delaware, Lackawanna & Western Co. and the Lehigh Coal and Navigation Co. on Coxe stokers

burn economically and at high ratings a coal as small as No. 4 buckwheat. In order to burn this latter size of fuel economically, and at a high rate of combustion, William Lloyd, formerly superintendent of shops for the Lehigh Valley Coal Co., redesigned the stoker.

The Coxe traveling grate now entered upon a different phase of its career. It would be extremely interesting to follow the experimental work of Mr. Lloyd as he perfected his plan for the modified Coxe stoker. It became apparent at an early stage of his experiments to burn the smaller buckwheats that each particle of these fuels was so light in weight that it was necessary to use a modified grate. In order to keep the forced draft from blowing the unburned fuel from the grate surface, a grate was designed which would permit the distribution of air beneath and through the fuel bed in sufficient volume to generate a high as well as an economical rate of combustion. Mr. Lloyd changed the air compartments with their controls in the grate in such a way that it is now possible to introduce forced draft beneath any part of the entire grate surface without appreciably affecting the fuel bed on the remainder of the grate surface.

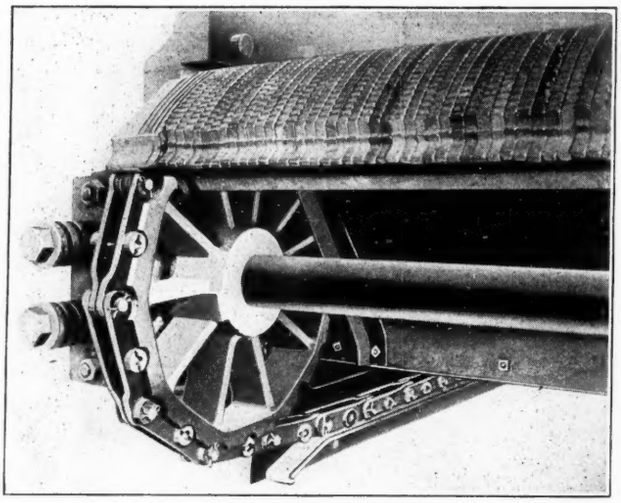


FIG. 6. DETAILS OF KEY ON CARRIER BAR; ALSO CHAIN AND SPROCKET WHEEL

Mr. Lloyd designed a "key," or grate finger, which distributes the air from beneath and through the fuel bed in a most satisfactory manner. The present standard key is a casting 8 in. in length by $\frac{3}{4}$ in. in width, having along one side 15 bosses (grooves) $\frac{3}{32}$ in. deep and $\frac{3}{16}$ in. wide. Across the top of the key are other grooves, $\frac{3}{32}$ in. wide and $\frac{1}{8}$ in. deep, 15 in number on one key with 16 on the keys in contact with it on either side. This staggered arrangement of the top surface grooves of the keys is shown in Fig. 7. A larger detail of the keys is given in Fig. 6. The object of the grooves is to make of the entire grate surface a series of channels which, when the forced draft is applied beneath the grate, subject the fuel bed to a "blanket" of air in large volume but with low velocity at any given point. Because of this uniform air distribution and control it is possible to operate the stokers at a high rate of combustion and high percentages of efficiency and economy.

Considering some of the mechanical features of the Coxe grate, it can readily be seen that the key is one of the important details. In fact, it is the essential feature of the stoker. These keys are arranged on carrier bars, which hold them in place, and are readily moved along the length of the bar in building up the grate. In practice, when keys give out at any time they are readily replaced on the end of the carrier bar, one at a time. The carrier bars extend from chain to chain, the latter being placed one on either side of the grate; the chains run over sprocket wheels and are driven from the end of the grate at the point where the ash is discharged, which is opposite the end where the coal is fed to the furnace. The arrangement of the keys on the carrier bar is shown in Fig. 6, as is also the carrying chain running over the sprocket wheel at one side of the grate.

The assembled grate, practically installed under a water-tube boiler, is shown in Fig. 7, which is a view from the inside end of the grate. The coal-feeding arrangement is shown in place at the other end of the stoker. The chain and double worm gear reduction is shown in duplicate at the left of Fig. 7; the left-hand feed is attached to a completed installation bricked in and ready to operate. The pit for receiving the ash from one of the stokers is hidden from view by the platform used by the workmen installing the furnace. A longitudinal sectional view of a stoker under a Babcock & Wilcox boiler is given in Fig. 8; the method of removing the ashes is also shown. A number of different plans are used in ash removal—by conveyor or scraper lines, by ash cars or by other mechanical means. Hand labor is done away with entirely, or is simplified in modern plants. A simple coal-handling apparatus is shown in the leading illustration; here coal is taken from the conical overhead hoppers to the distributing hoppers at the outside end of the grate by means of pipes.

The present method of draft control on a modern Coxe stoker is the result of years of experimentation. The air space in the grate is from 5 to 7 per cent. of the total grate surface. There is no large volume of air coming through the grate at any one point. Under the grate the air space is so partitioned that the proper amount of air is furnished to each part as needed. Thus the green-coal end of the stoker receives the most draft, and the air volume is steadily reduced until practically no air is supplied at the end where the coal is completely burned.

Turning from structural details to some practical illustration, a striking object lesson is presented at the Coadale plant of the Lehigh Coal and Navigation Co. Here there is a 750-hp. Stirling boiler unit equipped with two Coxe stokers, on which is burned a mixture which is practically silt with some No. 4 buckwheat in it. Two firemen are in attendance during 24 hours of service; one man on each 12-hour shift. Adjoining the Stirling boilers is a hand-fired boiler plant, with a total rating of 2348 hp., which is using rice and barley for fuel. At this latter installation a typical scene was being enacted at the time of the writer's visit to the plant. Eleven firemen were required every 24 hours to keep steam up. The men in attendance were engaged in cleaning fires, shoveling on coal and removing ashes—duties handled mechanically at the stoker installation. The opinion was expressed by the men in charge that the boilers being fired by the Coxe stokers at 200 to

200 per cent. above their rating were delivering more steam than all the hand-fired boilers put together. On the latter an efficiency of 68 to 75 per cent. of rating was maintained. The reason for this might not be so obscure when the difference between the two methods is analyzed. At the hand-fired plant, at one battery of boilers the furnace doors were swung wide open under one boiler while a fireman laboriously cleaned the fire, scraped out the clinkers and then shoveled on the coal so as to almost bank the fire. This condition existed at one end of the battery, while at the other end a fire which had been similarly treated some time ago was just coming to life and active service again. The two intermediate fires were keeping up steam in the four boilers of the battery. A similar unit adjoining made up the other half of the hand-fired boilers.

In the house containing the Stirling Coxe stoker outfit, the solitary fireman in charge was occupied in regulating the speed of the traveling grate and the amount of the draft and coal fed to the furnace. Occasionally he looked after the ash disposal. Normally, on opening the side doors in the brickwork inclosing the boilers and furnace the fire can be seen burning steadily at any hour of day or night; sometimes the flame comes out of these doors when the draft is increased somewhat, but the fuel bed on the grate varies little. The following are a few of the reasons given for being able to obtain high ratings and efficiency with the Coxe traveling grate with a minimum amount of labor:

The fuel bed is always thin, never more than 4 to 5 in. in thickness, thus allowing sufficient air to pass through the bed of burning coal for nearly perfect combustion with a minimum amount of resistance. The fires are cleaned automatically; the fuel is ignited as it enters the furnace, gradually burns down as the grate slowly moves toward the bridge wall, and the burned-out fuel (ash) is discharged into the pit. The forced-draft control and distribution is such that the air can be placed under the grate exactly and only where the fuel requires it for proper combustion, thus eliminating any excess. The speed of the stoker and draft regulation are so simply and easily controlled that unskilled labor can operate the stoker efficiently and at high ratings. Because of the simplicity of its operation one man can attend to a number of stokers.

TABLE I. OPERATING RESULTS OF ANTHRACITE BUCKWHEATS*

750-Hp. Boiler—Coxe Traveling Grate—Average Steam Pressure 125 Lb.	No. 1 Buck-wheat	No. 2 Buck-wheat	No. 3 Buck-wheat	No. 4 Buck-wheat	Un-cleaned Buck-wheat
Average horsepower of test	1,500	1,395	1,200	1,010	495
Maximum horsepower of test	1,750	1,600	1,400	1,100	650
Average per cent. rating	200	186	160	134	66
B.t.u. per pound dry coal	12,250	12,000	11,500	11,000	10,000
Combined efficiency of boiler, furnace and grate, per cent	74	70	65	61	45
Equivalent evaporation from and at 212 deg. F. per pound of dry coal, lb.	9.35	8.77	7.7	6.9	4.6
Dry coal consumed per horsepower per hour, lb.	3.69	3.93	4.48	5.00	7.5
Dry coal per square foot of grate surface per hour, lb.	25	25	25	25	25
Boiler horsepower per square foot of grate surface	6.8	6.36	5.5	4.9	3.3
Grate travel in feet per hour	16.6	16.5	16.2	15.2	11.1
Cost per horsepower per hour in cents	0.87	0.58	0.43	0.27	0.21

NOTE—Last figures correspond to prices at the mines and have to be adjusted to meet the various freight rates.

* Table by William P. Frey, Fuel Engineer, Lehigh Coal & Navigation Co., Lansford, Penn. Published in Fuel Supplement (July, 1918), Vol. 40, No. 7, of Journal of American Society of Mechanical Engineers.

The Lehigh Coal and Navigation Co. has passed the experimental stage as regards the use of Coxe stokers and is equipping other boilers with this type of furnace. The results being obtained by this company on the Coxe

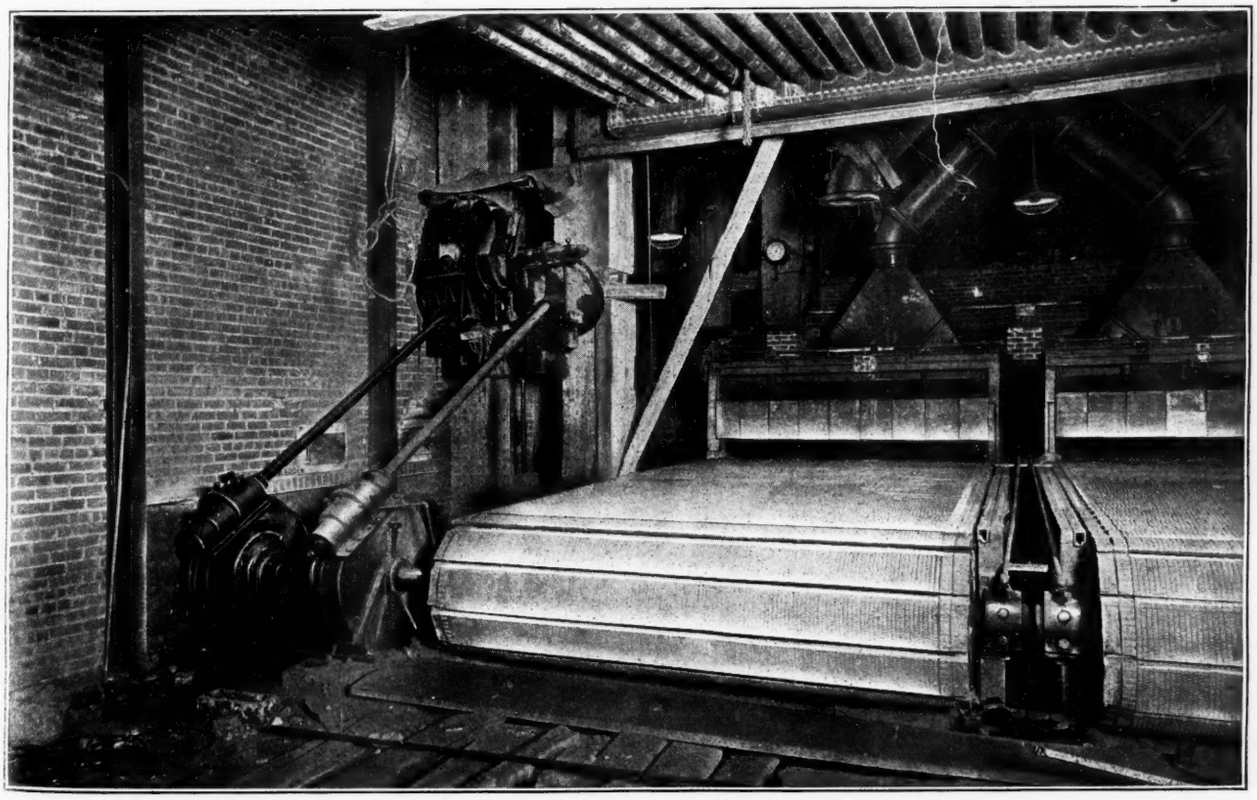


FIG. 7. STOKERS BEING INSTALLED UNDER BOILERS (REAR VIEW); STOKER DRIVE AT LEFT

traveling grate with some of the smallest sizes of anthracite buckwheats are shown in Table I.

In commenting on Coxe stoker practice and the table referred to, William P. Frey, fuel engineer of the Lehigh Coal and Navigation Co., states: "As it was found that a rate of combustion of 35 lb. of dry coal per square foot of grate surface was economical for all sizes, this rate was adhered to [in test recorded] as closely as possible by adjusting the speed of the grates and the air supply. As a rough guide for the boiler per square foot, which means that if the grate runs at 16.2 ft. in the case of No. 3 buckwheat, the bed must be carried 6 in. thick. If it is desired to carry only 4 in., the speed of the grate must be increased as 6 is to 4, or 1.5 times, to keep the same rate of combustion. It has to be understood, too, that 25 lb. per square foot is by no means the highest possible rating. The maximum rating obtainable according to our experience is: No. 1 buckwheat, 40 lb. per square foot per hour; No. 2 buckwheat, 35 lb. per square foot per hour; No. 3 buck-

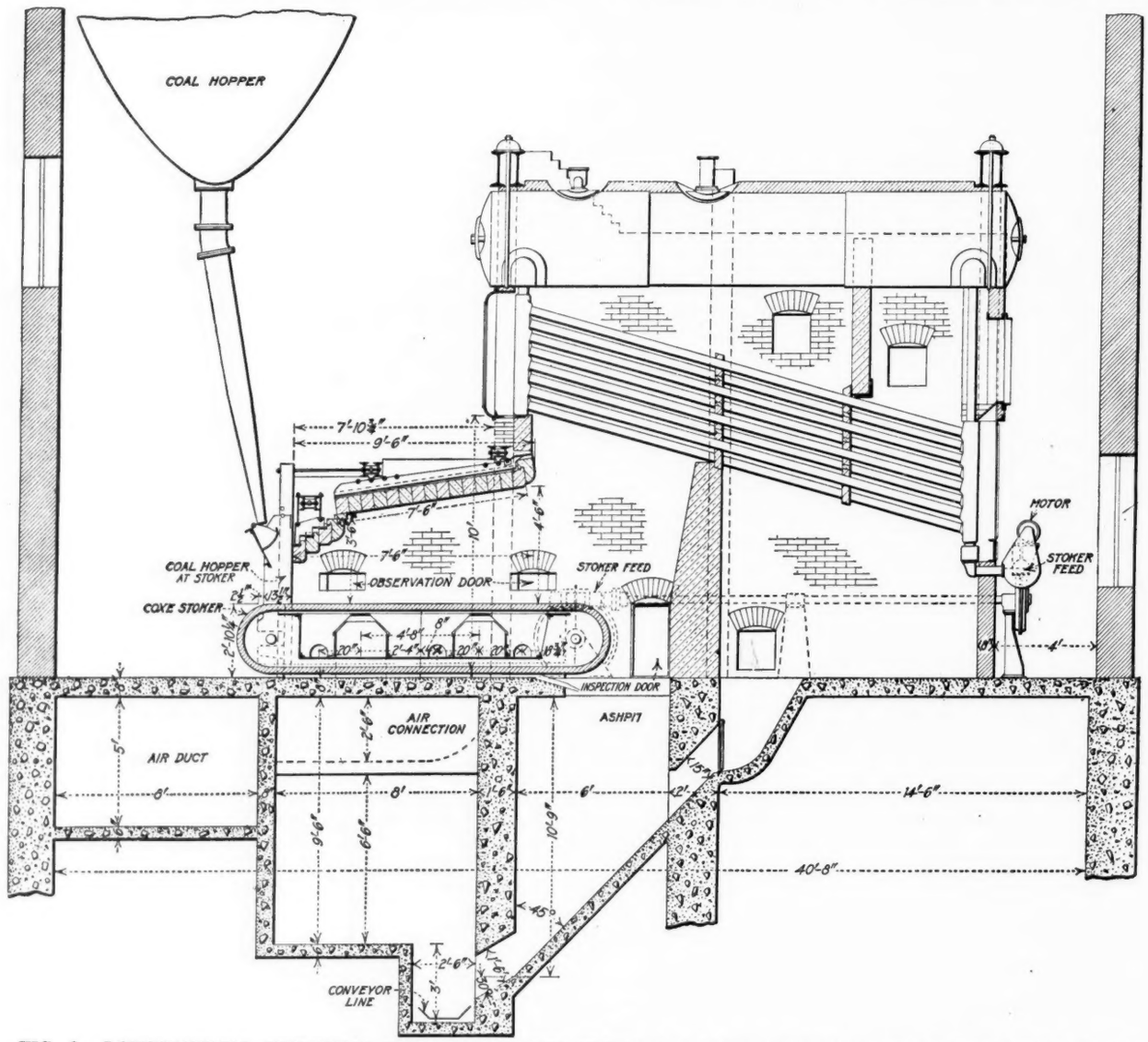


FIG. 8. LONGITUDINAL SECTIONAL VIEW OF STOKER UNDER BABCOCK & WILCOX BOILER, SHOWING METHOD OF ASH REMOVAL AND DRAFT

operatives, the blowers have to be set to deliver 20 cu.ft. of air per maximum horsepower. The air control goes hand in hand with the CO_2 recorder readings (these read 12 per cent. on the average) and the stack temperatures, which are to be kept below 500 deg. F.

"If the stack temperatures are high, the speed of the grate must be increased, the thickness of coal fuel bed reduced and the air pressure under the grate lowered, but the rate of combustion should be maintained as constant as possible. It is important to understand that the figures given in the line in the table—'grate travel in feet per hour'—are relative to 25 lb. of coal wheat, 30 lb. per square foot. per hour; No. 4 buckwheat, 27 lb. per square foot per hour; No. 5 buckwheat and uncleaned silt, 25 lb. per square foot per hour or less. These figures apply to a Coxe stoker with 7 per cent. air space in the grate. Good practice will keep the air pressure in the tuyeres as near as possible to 1 in. at the refuse (ash) end of the grate."

By comparison with the rating given by Mr. Frey, the following data relative to Coxe stokers furnished by John Van Brunt, chief engineer of the Construction Engineering Corporation, of New York City, are interesting: "No. 3 buckwheat can be burned at the rate of

30 lb. per sq.ft. with good efficiency, and as high as 40 lb. per sq.ft. at an expense of 3 to 5 per cent. in efficiency. For No. 4 buckwheat the maximum combustion rate for good efficiency is about 22 lb. per sq.ft.; at the sacrifice of 6 to 8 per cent. efficiency it may be burned at 30 lb. per sq.ft. Silt, or No. 5 buckwheat, can be burned at 16 to 18 lb. per sq.ft. per hour; the ash pit loss is high even at this combustion rate. It is possible to go up to 25 to 30 lb., but the efficiency will drop rapidly; at these higher rates the efficiency would be 40 per cent. or less. All these combustion rates can be maintained indefinitely. Subject to the limitations of the boiler, it is simply a question of providing as much grate surface as is necessary in order to develop as much power as desired." The following statement was made in respect to labor: "If a Coxe stoker plant is properly installed (properly laid out and planned), then one man can handle five or six stokers—that is, 4000 to 5000 developed horsepower. Not including ash handling, a man can look after 10,000 horsepower."

HELP COVER IT

As to the preparation of boiler fuel, Mr. Frey states: "It is evident that it is not only desirable to burn cleaned No. 4 buckwheat, but it is at the same time most economical if ample grate capacity is provided; and there will go hand in hand with the preparation of this size also the washing and concentrating of No. 5 buckwheat. But results show still more conclusively how important it is to use proper methods of firing, and the prime importance of keeping the market free from all fake products of unclean No. 4 and No. 5 buckwheat and uncleaned silt."

A number of the big anthracite companies are using the Coxe grate and reporting most favorably as to its operation. Among these companies are the Susquehanna Coal Co., with 50; the Philadelphia & Reading Coal and Iron Co., 24; the Pennsylvania Coal Co., 14; the Delaware & Hudson Coal Co., 14, and the Lehigh Valley Coal Co., with 6. Furthermore the following statement from an official of the coal-mining department of the Delaware, Lackawanna & Western Railroad Co. is significant:

"In our coal-mining department at present we have 41 Coxe traveling grates installed, six are being installed and 12 are on order. One man can operate ten stokers of the size we are using, and each of the stokers referred to is of proper size for installation under a boiler rated about 300 hp. With the fuel which we are burning we can obtain a capacity of about 150 per cent. and an overall efficiency of about 55 per cent.; this fuel could not be burned successfully with hand-fired operation. The stokers, when using coal which could be hand-fired, would give considerably greater capacity and probably equal, if not slightly higher, efficiency." The coal burned by the Lackawanna company is about the smallest anthracite saved in breaker or washery preparation.

Coal operators formerly believed that coal used about the mines cost nothing, and that in a steam plant only the cost of the plant was to be considered. Now the operator views steam generation as an item of expense involving the use of one ton of anthracite in the production of each eight or nine tons mined. No longer would silt be wasted by diversion to streams, flushing abandoned mine workings or improper stocking. It is not only valuable as raw fuel or in the manufacture of fuel, but by its use at the mines it releases many tons of larger sizes of anthracite better adapted to transportation and for industrial use at points removed from the anthracite field. Thus if silt was used for mine operation purposes, it would release about 8,000,000 additional tons of steam size anthracite that could be diverted to commercial use.

Millions of tons of anthracite silt have been flushed into mine workings, and as large if not a larger tonnage lies scattered about the region in the vicinity of breakers; some of this silt is in shape for recovery. During recent years it has been stocked after it was deposited in settling ponds, and many mines now have a large supply of this stoker fuel readily at hand. One of the large anthracite mining companies stated that it had in sight on the surface, available for immediate use, about ten years' supply of silt for boiler fuel. And each year contributes its quota to this resource of the operators—silt from fresh-mined coal and from the old banks. One admirable way to capitalize this abundant supply of fuel is to burn it on Coxe traveling grates.

On the average the original plant substance from which coal was formed contained about 40 per cent. of oxygen and a comparatively low percentage of carbon. As the process of the formation of coal went on the oxygen was gradually decreased and the proportion of the carbon thereby increased. Anthracite coal contains only about 2.5 per cent. of oxygen and a very high percentage of carbon. With the progress of carbonization, the percentage of the volatile matter also decreases and its quality undergoes a change which makes it easier to burn. Thus, although the oxygen content itself may not directly affect the combustion qualities of a coal it may be regarded in a way as an indicator of such qualities.—*Bureau of Mines Bulletin No. 135.*

A Reciprocating Underground Coal Conveyor

By J. F. K. BROWN
Scranton, Penn.

SYNOPSIS—*Some coal beds have an inclination such that cars may be handled to the rise only with difficulty, yet not enough to permit the coal to slide on sheet iron. In such cases the conveyor here described has been used with much success when other conditions were propitious.*

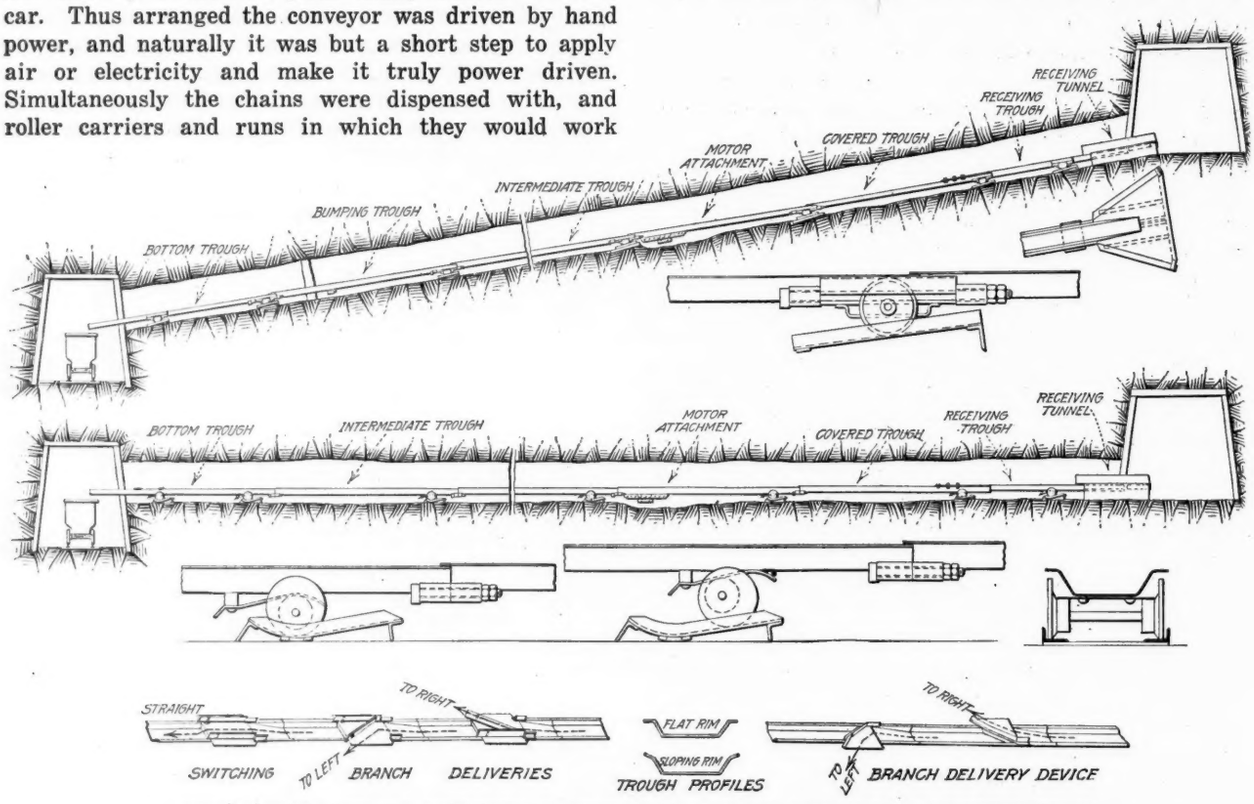
IN THE thin coal beds of the French Pas de Calais field, in Belgium and in Germany, an underground conveyor of a reciprocating type has long been in operation. Although the principle upon which it operates is not new, its application to underground conditions gave rise to a type of appliance that is popular and has been largely used in the fields mentioned.

The idea originally grew out of the series of sheet-iron plates once used and still in operation in pitching workings, to slide the coal from the faces to the rise to the cars in the level. From that, in beds whose pitch was inadequate to run the coal by gravity, it occurred to someone to lift these plates and hang them by chains to the roadway timbers, and to so set the line of plates thus hung that in swinging them to and fro one end would bump against a tree or wood block at the loading end, the sudden cessation of the motion of the plates causing the coal to continue to slide forward and thus by a series of jerks finally deliver it to the car. Thus arranged the conveyor was driven by hand power, and naturally it was but a short step to apply air or electricity and make it truly power driven. Simultaneously the chains were dispensed with, and roller carriers and runs in which they would work substituted. Thus was evolved the conveyor as it stands today.

Essentially this conveyor works in a similar fashion to an inclined or horizontal shaking screen. The reciprocating motion is imparted to the pans either direct, through a bell crank arrangement, or through a rope arranged triangularly as shown in the accompanying illustrations. Where the inclination is more than 8 deg. this to and fro motion is all that is required, the work of the engine being merely that of pulling the series of pans back up the incline provided by the runways in which the rollers work. On the down stroke the weight of the conveyor and its load is sufficient to impart motion, which is ended abruptly against what is called a bumping beam, the coal continuing its travel along the pans in the direction of the car to be loaded.

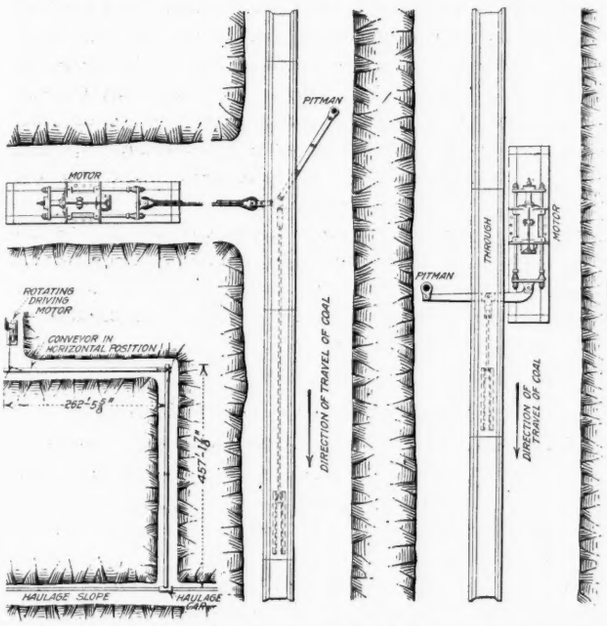
On inclinations which are less than 8 deg. this bumping beam is dispensed with, and while the engine still only imparts the to and fro swing, another motion is given to the conveyor. In this case the roller runways are so arranged that the pans rise slowly on the forward stroke and, synchronizing with the turn of that stroke, fall rapidly away from beneath the material carried, which continues its forward direction.

The conveyor itself consists of a series of shallow pans, about 4 in. in depth and of varying shapes and designs, ranging from 19 and 20 in. down to 15 in. in width. Usually these pans are built in lengths of 12 ft. and fastened together so as to form a total length



A HORIZONTAL AND AN INCLINED CONVEYOR AND SOME DETAILS OF CONSTRUCTION

of conveyor up to 400 ft. In the installations designed for workings with over 8-deg. pitch, the various lengths from the top down are known as the receiving trough, the covered trough, intermediate troughs, the motor trough, the bumping trough and the bottom trough. In the other type of installation they are known by similar names, with the exception of the bumping trough, which is absent. The intermediate trough is the only one which is of constant design, each of the others having



TYPICAL ARRANGEMENT OF CONVEYOR AND DETAILS OF TWO METHODS OF OSCILLATION

some particular difference which fixes its position in the conveyor.

The receiving trough is wide mouthed, being so arranged that a car of coal may be tipped onto it in an upper level. The covered trough takes its name from the fact that the receiving trough is so arranged as to cover it and be capable of being slid up or down the requisite distance so as to accommodate any slight variations there may be from time to time in the distance from the loading point to the end of the conveyor. The motor trough, which usually comes next in order downward, has riveted underneath it a steel angle with a series of holes drilled therein to which the extension of the engine piston or bell crank, as the case may be, is attached. This allows for some variation in the exact position of the motor. Below the bumping trough, commonly the second from the bottom, is fixed the bumping beam. The bottom or delivery trough has two roller supports in contradistinction to the others, which have one each.

All the sections of the conveyor are joined together by strong bolts passing through two lugs, one on each side of each section, each section slightly overlapping the one below. Two nuts bring the bolts and lugs together, the top one being a lock nut. On each section at the top end is bolted the carrier plate, which is curved, the lower end of the section being supported by the section below. On the ground below these carrier plates is placed the runway plate, also curved in the fashion indicated in the illustrations.

The rollers that operate between the carrier and the runway plates consist of an axle and an inner and outer roller of different diameters, and with centers that are not concentric. The outer rollers are approximately 10 or 11 in. in diameter, and the inner ones 4 to 4½, while the center lines are offset about an inch. It is this eccentric arrangement, together with the motion imparted by the engine operating through the curved paths of the carrier and runway plates, which gives the peculiar motion up and down as well as backward and forward that causes the coal to travel in the proper direction. In the installations for pitches of 8 deg. and over the paths of the carrier and runway plates are straight, and are then simply inclined planes.

A neat type of air engine is often used to drive the conveyor. This is a single cylinder built into a triangular frame. It is compact enough to go into the thinnest of beds, and is furthermore of such a shape that the height is the lowest dimension, with the width next, which is as it should be for underground work.

The engine foundations are usually timbers about a foot longer than the engine itself, propped against the floor from the roof and fitted under the frame without adding an inch to the height. The engine has a stroke of from 10 to 15 in. and a piston diameter of 6 to 12 in. In order that the piston may be properly guided during its stroke, and also that the drive of the engine may be from either end, a pair of guide rods pass through projections of the engine bedplate from the piston end to the rear, and where they are joined to the crosshead two springs take up the shock of the change of direction of motion. The inlet to the motor is at one end and is manipulated by a crank passing over the top of the engine. When the piston reaches its full stroke, this crank opens the exhaust port, the return swing of the conveyor brings back the piston and rod, and at the bottom of the stroke air again enters.

This conveyor is employed not only in the longwall faces, but also in rooms, and as part of the transportation system where the pitch is greater than that on which a car can readily be handled; also where the coal beds are low. In the longwall faces the conveyor is built the length of the face and stretches in a straight line behind the men working thereon. As the height of the conveyor is small the coal does not require to be lifted very far, and consequently a machine cut face is rapidly loaded away. In this case the conveyor is loaded anywhere along its full length and the loading trough is dispensed with.

In room and chamber work the conveyor is loaded on the end, the broad shovel-shaped extremity of the loading trough facilitating this. Through sections are added to the conveyor as the chamber lengthens.

An illustration is given of the use of this machine as part of the transportation system. Here the conveyor is shown delivering coal along a section 260 ft. in length, into another section 460 ft. long, making a total of 720 ft. before reaching the car. Both these conveyors are driven from one engine, one conveyor driving the other.

An interesting feature is the capability of this conveyor to discharge material if required at any point along its entire length. This is accomplished by the aid of what is termed a branch delivery device, which consist of a specially built series of plates, fitting inside

the conveyor pan, and arranged on such an incline that the material is raised over the lip of the pan and is discharged either to the right or left as desired. As may be imagined in room work wherever rock is made in the mining, this rock can be loaded onto the conveyor after or before the coal and discharged alongside the conveyor line. This is equally handy in a longwall face where rock is made, as it can then be transported and discharged wherever a pack wall has to be built.

While such an appliance has many advantages and has been a decided success in many coal fields, more than 40,000 ft. being in regular operation, it also has some shortcomings. It requires, for example, an air engine, because although it is possible to apply an electric motor, a motion of the type required is much more easily secured from a reciprocating engine than from a motor, whose motion has to be converted into reciprocation by a system of wheels and levers.

Secondly, the conveyor is only suitable for even floors—that is, floors without undulations. Being one continuous line the conveyor requires to be straight and of regular grade throughout its length. Any depression in the line will cause trouble.

A third defect is the inability of this conveyor to deliver material in the reverse direction. While not essential nor common with most conveyors this is nevertheless quite desirable in many mining sections.

Consumers Mining Co. Development

The Consumers Mining Co., of Harmarville, Allegheny County, Pennsylvania (a subsidiary corporation of the La Belle Iron Works, Steubenville, Ohio), is making commendable progress on the concrete lining of the shafts and also on underground work on the coal property the company acquired near Harmarville last April. The mine is 10 miles from Pittsburgh, near the Conemaugh Division of the Pennsylvania R.R., and about 1500 ft. from the Allegheny River. Prepared coal will be shipped by rail and river to the La Belle Iron Works for coking and steam use. The ultimate capacity of the plant has been planned for 5000 tons per 9-hour day, but the proposed surface installation for the present will be equipped for preparing and shipping 2500 tons per 9-hour day. The contracts for the surface building with equipment have not been awarded; the plans show steel construction, which will be fireproof and as modern as the skill and ingenuity of our foremost engineers can design.

The proposed electric hoist will deliver two skips (of three tons each) of coal per minute into a 1000-ton bin; from this bin the coal is to be mechanically fed to a Bradford coal breaker and cleaner. The slate, pyrites, rock, bony and hard coal of high ash content passing out of the end of the screen will be delivered by cars to a dump; or the bony and hard coal will be separated from the distinct impurities by hand picking, if found in sufficient quantity and quality for steam or domestic use. The coal passing through the meshes of the Bradford screen will be directly loaded onto railroad cars or delivered to coal barges on the Allegheny River. This will be done by means of either a system of belt conveyors approximately 1500 ft. long or by electric carriers. The breaker is so located that a crusher can be installed at some future time directly under the breaker for the purpose of crushing the ½-in. coal to dust preliminary to separating the impurities from the coal by washing or by some other modern method. Experimental washing tests indicate that the coal can be cleaned to a sufficient degree to produce a coking coal of approximately 7 per cent. ash content, and less than 1 per cent. sulphur content; this can be done by removing about 8 per cent. of the impurities mixed with the crushed coal.

The Upper and Lower Freeport seams to be mined are separated by a slate and bone band of from 4 to 12 in. The lower seam averages 36 in. in thickness with an ash content of about 4 per cent. and sulphur content of less than 1 per cent.; while the upper seam averages 48 in. in height, with a variable high ash and sulphur content. R. W. McCasland, superintendent of the coal and coke department of the La Balle Iron Works, considers it impractical to attempt to mine the two seams and deliver on cars separately. The owners propose to build about 50 miners' houses in the near future. The ultimate surface plant is estimated to cost approximately $1,000,000.

Neville Island Coal Plant

The United States Steel Corporation's "Ordnance Department," now under construction on Neville Island, adjacent to Pittsburgh, Penn., is to include a comprehensive coal-storage and handling equipment for boiler and producer coal.

Barge coal from the mines on the Allegheny and Monongahela rivers will contribute a large tonnage. Preliminary plans call for a large storage plant with an open yard 150 ft. in width, 670 ft. in length and means for piling coal 50 ft. high, creating a mass of about 90,000 tons.

The high and low water variation of the Ohio River at Neville Island is 35 ft. To protect the coal from water the yard will be inclosed by extensive concrete walls rising about 9 ft. above high-water mark. For track coal unloading pits will be constructed. A traveling coal-handling trolley bridge of about 154 ft. span will be provided with a 7½-ton bucket; it will take the coal from barges and let it fall on the storage yard, or it will take coal from a storage pile and deposit it in hoppers (of 250 tons capacity) directly over the coal-preparation building.

The coal-preparation equipment will consist of mechanical feeders, rolls, crushers and revolving screens, to size the run-of-mine coal for boiler or producer use. The prepared coal is to be stored in pits, one for boiler use of 2400 tons capacity, or 52 hours normal supply, and one for producer use of 3000 tons capacity, or 40 hours normal supply. A stationary coal-handling bridge provided with one 7½-ton and one four-ton bucket will transfer the prepared coal from storage pits to the bunkers over boilers and producers. An ash-handling and disposal equipment is contemplated, also a water purification installation.

Copper ranks next to steel as the most important war metal. Of a world's production of approximately 3,100,000,000 pounds in 1917, the refineries of the United States produced 2,362,000,000 pounds, or a trifle less than 80 per cent.

How Prices of Bituminous Coal Were Fixed by the Fuel Administration*—I

BY CYRUS GARNSEY, JR., R. V. NORRIS AND J. H. ALLPORT
Engineers to United States Fuel Administration

DURING the latter part of 1916 and the early months of 1917, due to war activities, there was a threatened shortage of coal which resulted in panic among consumers and a rush to obtain coal at any price. As result of this insistent demand for immediate delivery, prices were bid up by the consumers to unprecedented heights; spot coal which had previonsly been selling at from $1.50 to $2 per ton was bid up to $5, $6, and, in exceptional cases, as high as $7.50 or more per ton. Then when the April, 1917, contract period arrived, contracts could be made only at prices ranging from $3 up to $5 and $6 per ton for the year's delivery. This condition caused such a demoralization of the business, and so much complaint, that some action to regulate prices was considered essential by the National Administration.

In May, 1917, a committee under the chairmanship of F. S. Peabody, of Chicago, was appointed by the Council of National Defense, through Mr. Lane, to consider the whole question of bituminous coal. This committee, with the Secretary of the Interior, Mr. Lane, after numerous meetings and long negotiations with the operators throughout the country announced on June 29 an agreement between the committee and the producers, fixing a tentative maximum price for bituminous coal throughout the country at $3 per net ton f.o.b. mines, to which was added 25c. for selling commission to wholesalers. This plan was based on the idea of fixing a maximum price, high enough to greatly stimulate production, with the expectation that the laws of supply and demand would, with ample production, operate to maintain fair and just prices for coal throughout the country.

With the country plunged into the greatest war of history, it became evident that distinct power should be given the Administration to control efficiently war necessities, food and fuel, needed in ever-increasing amounts, not only by our own country but by our allies, and for our armies in this country and abroad. With this in view, the Sixty-fifth Congress passed House Bill No. 4961, generally known as the "Lever Act," entitled "An Act to provide further for the national security and defense by encouraging the production, conserving the supply, and controlling the distribution of food products and fuels." It was approved Aug. 10, 1917.

Section 5 of the Lever Act authorizes the licensing of "the importation, manufacture, storage, mining or distribution of any necessities"; and Section 25, "to fix the price of coal and coke, whenever and wherever sold, either by producer or dealer." It is further provided in this section "in fixing maximum prices for producers, the commission shall allow the cost of production, including the expense of operation, maintenance, depreciation and depletion, and shall add thereto a just and reasonable profit." "In fixing such prices for dealers the commission shall allow the cost to the dealer and shall add thereto a just and reasonable sum for his profit in the transaction."

[The powers of the Federal Trade Commission as to coal were, with certain minor exceptions, transferred to the United States Fuel Administration by order of the President on July 3, 1918.]

On Aug. 21, 1917, the President announced prices for bituminous coal throughout the United States, specifying prices for run-of-mine, prepared sizes, and slack or screenings, by states and, in a few instances, by districts or by seams. These prices for run-of-mine coal varied from $1.90 to $3.25, and were, in general, a very great reduction from the prices fixed by the Lane-Peabody Commission. These prices were based on average figures on about 100,000,000 tons production, prepared by the Federal Trade Commission, from the very meager data in its possession, generally costs from the larger and lower-cost operations of each district.

On Aug. 23, 1917, Harry A. Garfield was appointed United States Fuel Administrator by the President, and to him was delegated the powers as to fuel, conferred by said act on the President. On the same day, by Presidential proclamation, prices were fixed on Pennsylvania anthracite coal. From this date until early in January, 1918, numerous revisions and adjustments of "the President's prices" were made by the Fuel Administrator, but no general revision was attempted.

Early in January, the Engineers' Committee was constituted, and to this committee was entrusted the making of a general review of costs, and the submission to the United States Fuel Administrator of the results of careful studies of the costs of producing coal throughout the United States. The committee was not then, and never has been, authorized to fix prices on coal; the limit of its duties has been to study and report on methods of price fixing and to determine and furnish costs, leaving to the Fuel Administrator the personal duty of determining the amount of margin to be allowed.

The committee's first work was a study of price-fixing methods which were, or might be, applicable to coal-producing conditions. In arriving at a logical and scientific plan for fixing the price of fuel the following methods were considered:

1. *Straight Cost Plus Method.*—The actual cost at each colliery plus a fixed sum or percentage of profit.

2. *Modified Cost Plus Method.*—The actual cost at each colliery plus a graduated profit decreasing as costs increase.

3. *Average Cost Methods.*—Prices fixed on the average cost in each district.

4. *Pooling Methods.*—All coal sold at the average cost of each district plus a profit, and the returns to each colliery adjusted through a clearing house at a price proportioned to its cost of production.

*Paper presented at the Colorado meeting of the American Institute of Mining Engineers, September, 1918.

Discussion of Advantages and Disadvantages of These Methods

1. *Straight Cost Plus Method.—Advantages.*—(*a*) All producers would receive the same profit, and no one would have an advantage over another in this respect. (*b*) Apparently simple in plan and execution.

Disadvantages. — Impracticable of application, by reason of: (*a*) Resultant multiplicity of prices, with grave disturbance of markets. (*b*) Continual changing of prices due to inevitable variations in each producer's costs. (*c*) Instability of the industry, due to the natural disposition of consumers to purchase the lowest-price coal. (*d*) Inefficiency in operation always resulting from lack of incentive in cost plus operations. (*e*) Material reduction in output and reduction in quality due to the natural tendency to mine the poorer and more expensive coal with a guaranteed profit, and to leave the better and cheaper coal in reserve to be mined on the return of normal conditions. (*f*) Continual increase in all costs incidental to extravagant methods encouraged by guaranteed profits. (*g*) Labor unrest and constant demands for increases due to the knowledge of a guaranteed profit regardless of cost. (*h*) Practical impossibility of arriving with technical accuracy at the costs of each separate operation. (*i*) Impracticability of the Government's policing the mines and securing the same efficient operation and production attained by the individual producer under the stimulus of increased profits. (*j*) Illogical, in that the better planned and managed operations are discouraged, as compared with poor and inefficiently managed properties.

2. *Modified Cost Plus Method.*—This is but a modifi-

FEDERAL TRADE COMMISSION FILE No.....

BITUMINOUS COAL REPORT ON COST, INCOME, AND TONNAGE FOR....., 191
(Period, Month or Year.)

COMPANY MAKING THIS REPORT { FULL NAME..... ADDRESS.....

LOCATION OF MINES
District.....
State.....
County.....

COST

ITEM	LABOR	SUPPLIES	TOTAL AMOUNT	TOTAL PER TON
I. MINE EXPENSE	$	$	$	$
(1) OPERATING EXPENSE:				
(2) Mining,				
(3) Yardage,				
(4) Transportation,				
(5) Ventilation,				
(6) Drainage,				
(7) Dead work,				
(8) Tipple or breaker,				
(9) Washery,				
(10) Miscellaneous,				
(11)				
(12) Total,				
(13) Power,				
(14) Power-house fuel, tons,				
(15) Superintendence and engineering,				
(16) Mine office,				
(17)				
(18) Total,				
(19) Total Operating Expense,				
(20) GENERAL EXPENSE AND FIXED CHARGES.				
(21) Royalty,				
(22) Depletion reserve,				
(23) Depreciation reserve,				
(24) Maintenance reserve,				
(25) Contingent reserve,				
(26) Taxes (exclude income and excess profit) %				
(27) Insurance—General,				
(28) " Liability, or Compensation,				
(29) Officers' salaries and expenses,				
(30) Other general office salaries and expense, %				
(31) Legal,				
(32) Miscellaneous,				
(33)				
(34) Total Gen. Exp. and Fixed Charges,				
(35) Total Mine Expense,				
II. SELLING EXPENSE				
(36) Commissions,				
(37) Advertising,				
(38) Bad accounts,				
(39) Allowances,				
(40) Salesmen's salaries and expenses,				
(41) Officers' salaries and expenses,				
(42) Other office salaries and expenses, %				
(43) Miscellaneous,				
(44)				
(45) Total Selling Expense,				
III. OTHER EXPENSE				
(46) Taxes—Income and excess profit,				
(47) Interest,				
(48) Sinking fund,				
(49)				
(50) Total Other Expense,				
(51) CAPITAL AND MAINT. RESERVE CHARGES:				
(52) Improvements,				
(53) Developments,				
(54) Maintenance,				
(55)				
(56) Total Capital and Maint. Reserve Charges,				
(57) SUPPLIES:				
(58) Supplies on hand 1st of month,				
(59) Supplies purchased during month,				
(60) Total,				
(61) Supplies used during month,				
(62) Supplies on hand end of month,				

INCOME

	AMOUNT
(63) COAL SALES:	$
(64) Local sales, at per ton,	
(65) Shipped, at per ton,	
(66) Railroad, at per ton,	
(67) Coke, at per ton,	
(68) Power-house fuel, at per ton,	
(69)	
(70) Total Sales,	
(71) COST OF SALES:	
(72) Total mine expense (Item 35),	
(73) Coal purchased,	
(74) Total,	
(75) Inventory 1st of month,	
(76) Inventory end of month,	
(77) Increase or decrease in inventories,	
(78) Total Costs (Add 74 and 77),	
(79) Gross Profit on Coal Sold (Subtract 78 from 70),	
(80) MISCELLANEOUS PROFITS:	
(81) Powder,	
(82) Interest on pay roll advanced,	
(83) Smithing,	
(84) Heat, light, and power,	
(85) Dwellings and farms,	
(86) Stores,	
(87) Standard-gauge railroad equipment,	
(88) Floating equipment,	
(89) Coke and by-products,	
(90) Other income,	
(91)	
(92) Total gross profit,	
(93) Selling expense,	
(94) Other expense,	
(95) Total,	
(96) Total Net Income,	

COAL TONNAGE. (2,000 Pounds)

	PREPARED	RUN-OF-MINE	SLACK	TOTAL
(97) SALES:				
(98) Local,				
(99) Shipped,				
(100) Railroad,				
(101) Coke,				
(102) Power-house fuel,				
(103) Total Sales,				
(104) Add				
(105) Inventory, end of month,				
(106) Total,				
(107) Deduct				
(108) Inventory 1st of month,				
(109) Purchased coal,				
(110) Total deductions,				
(111) Production,				

(112) Kind of coal, Number days worked,
(113) Name of number of seam, Cause of idle days,
(114) Thickness of seam,
(115) Number of mines,
(116) Remarks:

Approved and Certified Correct: ....
(Name.) (Title.)

This Report Must be Signed by an Officer of the Company.

FACSIMILE OF REPORT WHICH HAD TO BE MADE OUT BY EACH PRODUCING COMPANY

cation of the preceding, and the same discussion applies. modified only by the inclusion of a somewhat greater incentive to the better and more economical operations.

3. *Average Cost Methods.—Advantages.*—A minimum uniform price for each district or, if desired, for the entire country.

Disadvantages.—(*a*) The average cost is necessarily less than the cost of about half the total tonnage. Hence, a reasonable profit put on the average cost would not produce the necessary tonnage. (*b*) The tonnage below and up to the average cost is actually produced by less than 30 per cent. of the operators of the country. Hence, the great majority of the operators producing at above average cost would be put out of business by a price based on the average.

4. *Pooling Methods.*—Pooling may be done on either cost plus, modified cost plus, or on the prices established by the United States Fuel Administration.

Advantages.—(*a*) A uniform price to consumers for sections and, if desired, for the entire country. (*b*) A present lower price to consumers based on weighted average cost. (*c*) A simplification of all present pooling arrangements, as all coal to each pool would have, or could be arranged to have, the same price. (*d*) A return to the consideration of quality instead of cost, as, with all coal at the same price to consumers, the higher qualities would naturally be preferred.

Disadvantages of Pooling Cost Plus on Modified Cost Plus Methods.—(*a*) Continual variation in pool prices, due to inevitable variations in producers' costs. (*b*) Unfair and illogical, in that the better located and managed operations are made to pay tribute to the poor and badly managed ones. (*c*) A general and considerable increase in cost inevitably resulting from any method involving guaranteed profits with a disregard of economy. (*d*) A material reduction in output, due to lack of incentive and resulting inefficient methods, the employment of unnecessary labor, the mining of the more expensive and less desirable qualities of coal for the ultimate benefit of the mines, and the execution of development not immediately needed. (*e*) A slacking of the efforts of employees, which is the usual result of a lack of incentive to the producer, with the resulting lack of interest. (*f*) The installation of an unsound policy tending to encourage the inefficient and discourage the efficient producer. (*g*) The ever-present temptation to allow costs to increase with the hope of readjustment of prices. (*h*) Dissatisfaction to both labor and to producers from the knowledge that other and less efficient operations have higher limits of price.

The disadvantage of pooling on the prices fixed by the United States Fuel Administration are the same as suggested above, without some of the special disadvantages of cost plus methods.

Disadvantage of Pooling in General.—(*a*) A very large capital required to handle such stupendous operations. (*b*) Enormous and extended credit required to finance the producers. (*c*) Lack of organization to handle this new business. (*d*) Undesirability of creating such an organization with its army of additional employees at the present time. (*e*) Inadvisability of putting a new and untried plan into operation at the present time. (*f*) Impossibility of obtaining, with sufficient promptness, the costs necessary to fix pooling prices with the necessary accuracy. (*g*) Interference with present established methods of handling coal, with serious risk of crippling its distribution and unnecessarily creating a shortage.

None of these suggested methods seemed to fill the peculiar conditions incident to price fixing of coal at the mines, and it devolved upon the Engineers' Committee to develop some method better suited to the conditions of the problem.

The Price Fixing Method Adopted

The study of the conditions indicated the necessity of finding a method of price fixing which would fill as nearly as practicable the following requirements: (1) Result in a price fair to the public. (2) Prevent excessive prices or profiteering. (3) Prevent a multiplicity of prices in any district. (4) Encourage legitimate production. (5) Discourage production from inefficient and unduly costly operations. (6) Insure to the producer "the cost of production, including the expense of operation, maintenance, depreciation, and depletion, with a just and reasonable profit," as required by the Lever Act.

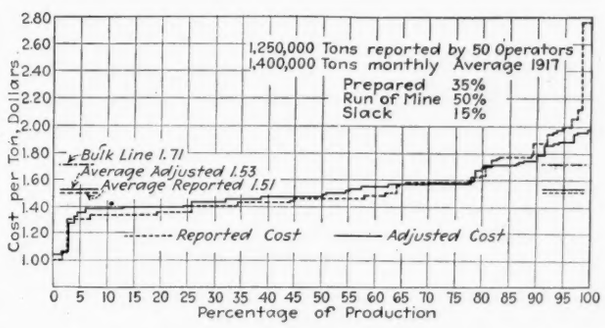


FIG. 1. HOW PERCENTAGES WERE PLOTTED

In arriving at a method promising to accomplish these results as nearly as practicable, the following system was developed. Costs obtained from the individual sheets filed by each operator with the Federal Trade Commission were studied, listed and adjusted for price fixing. These figures, with the percentages of each cost in the total production of each district, were plotted on diagrams, showing graphically the range and extent of variation in each district. On these diagrams a line indicating the sources of indispensable tonnage, christened "the bulk line," is drawn as a base to which the Fuel Administrator personally adds a margin in his judgment necessary for each district.

Advantages of This System.—The method of fixing prices by the "bulk line" principle recognizes the economic syllogism that "the price of any article necessary to a community will be fixed by the cost of producing that necessary portion of such article involving the greatest expense." (*a*) This assures to all producers profits dependent upon their ability and exertions, only limited by the establishment of a reasonable price to the consumer. (*b*) It does not unduly increase the price of coal to the consumer over the minimum price possible under other methods. (*c*) It tends to encourage maximum production and necessary development by allowing to the producer the benefit of reduced costs due to greater production. (*d*) It avoids bad feeling among the producers and among the workmen by allowing a fixed price in each district and not apparently

showing favoritism to special producers. (*e*) It tends to encourage the fit and discourage the unfit. (*f*) The method is susceptible of refinement and extension, making it possible to eliminate undue profits to the producer and adjust prices from time to time to the ultimate advantage of the consumer.

Disadvantages of This System.—(*a*) Considerable profits to the lowest-cost operators. (*b*) A price for coal greater than one based on the average cost, by the amount by which the "bulk line" exceeds such average. This method appeared to be better suited to the conditions than any of the others suggested, and after a careful study by the United States Fuel Administrator, it was adopted.

The Federal Commission had, by authority of the Act of Congress creating the commission, the power to investigate costs, and to require, under penalty, reports of costs of operation. Under this authority the commission sent out to each coal producer listed in the United States blanks requiring a rather complete and detailed statement of costs of operation, and the realization obtained from the sale of his product. These reports were generally available for the months of August and September, 1917, at the time the revision of prices was started, and reports for these two months, studied in connection with later reports, were generally used as a basis of costs for the first studies. It further developed that these two months were, in most instances, fairly representative, as to output, of the average of the year.

Without desiring to impugn either the honesty or the accuracy of the cost sheets as presented, it was found essential to study and adjust them for use as a basis of scientific and accurate cost finding. Besides correcting slips and palpable mathematical errors, a considerable amount of revision was necessary. Many, especially of the small operators, were inexperienced in bookkeeping and submitted cost sheets which, while accurate in totals, were grievously mixed in details.

Supplies.—The item of supplies was found to vary so widely in the same mines in different months that the returns for single months were practically abandoned,

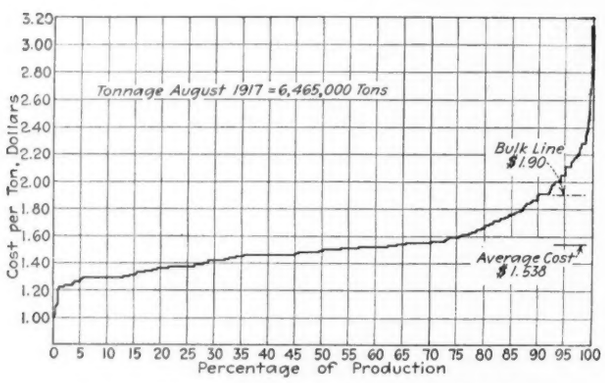


FIG. 2. SHOWS COSTS FOR AN ENTIRE AREA

and the figures were replaced by averages from all reports available, resulting in increases or deductions from the monthly costs as reported.

Reserves.—The item of maintenance was frequently misunderstood, in some instances all supplies and much labor being charged to this account; in others a fixed sum, and in still other cases, nothing at all was charged. Depreciation was often put in as a guess; in some cases it was frankly stated that this seemed a good time to charge off improvements, and such were charged to the limit, and beyond.

Depletion of lands was also an item which appeared greatly to trouble some of the accountants. While generally understood, many very wild guesses, even up to the market price of the product, were found; also, many instances of depletion charges for lands operated on royalty or lease and not the property of the operator.

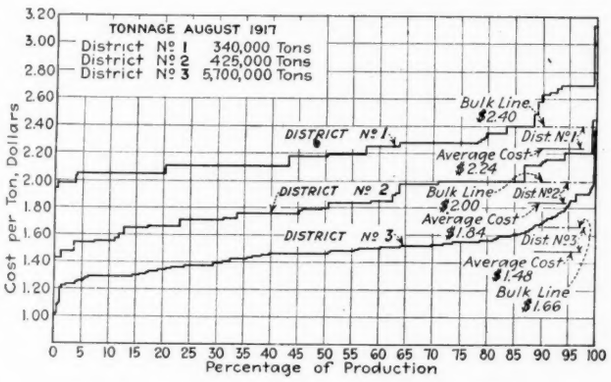


FIG. 3. SHOWS COSTS IN THREE DISTRICTS

Contingent funds noted on the blank were generally omitted but, in a few cases, especially when the need of such funds had recently been felt, most ample allowances were made. After being considered, it was decided to apply in each district amounts obtained by studying the claims of the better operators of such district, after obtaining, from the best available sources, reliable figures as to the cost of lands and amount and value of improvements characteristic of the district.

The question of contingent reserves is a serious one. From a strict cost-accounting standpoint, no cost can be permitted until incurred. Nevertheless, such reserves are essential to an industry involving the great risk incident to coal mining, and with the full knowledge that such reserves are used only for major accidents or calamities, and that ordinary losses regularly incurred are charged to the costs of operation, it was decided to include a small amount for contingent reserve in the general allowance.

Salaries—Executive and even superintendent's salaries were frequently omitted. In many cases of personal ownership, undoubtedly none were paid. It was considered only just to add to such returns reasonable allowances for salaries to place such reports on a parity with the majority of the operations which paid for such necessary service. On the other hand, occasional instances were found of reported salaries so excessive as to require adjustment downward to a reasonable parity with the general practice of the district.

A sliding scale of salaries adjusted, within broad limits, to the monthly tonnage of an operation was finally devised. Any salaries missing or below the minimum allowed were raised to the minimum, and those above the maximum were lowered to the maximum.

Special Charges.—Special charges were generally treated in details, often spread over a reasonable time rather than allowed in a single month. In treating these a careful study of all reports available was made.

Special Records.—The Federal Trade Commission had required special explanations of all charges out of the ordinary, and all these records were available and were carefully studied and had great influence in deciding doubtful points.

Outside Profits.—The profits from farms, dwellings or stores are not properly mining profits, and accounts of these should be kept separate from mining expense. Where it is found that such accounts are separated, no deduction for such profits should be made; but where dwellings, particularly, are so intimately connected with the mining that no separation is possible, it is proper to include their operation with mining accounts.

Fuel for Power.—In general, charges for fuel for colliery power were allowed, and the tonnage divisor was made to include such fuel. In the opinion of the committee it would, however, be advisable to eliminate colliery fuel from both sides of the account and merely to keep a record of the amount used; by this method, the tonnage divisor represents the amount shipped and sold and is susceptible of accurate determination, while the fuel used is approximated, or even guessed at, too often to make the general records containing this item reliable.

Other items requiring occasional adjustment were the inclusion of washing costs, for which an extra charge is allowed, in the mining cost, and the inclusion of labor and supplies used in coking operations conducted by the same operators. In a few instances, the coke tonnage, or a mixed tonnage of coal and coke, was reported and used as a divisor to obtain costs per ton, resulting, of course, in a notably excessive cost

In general, each and every cost sheet was studied carefully by at least one member of the committee, all adjustments were considered by at least two, and only such adjustments were made as were warranted by the conditions and the necessity of placing all costs on the same basis, so as to find a just basis of cost for fixing the prices for each district.

(To be continued)

Advantages of Using Power Gas

By Mark Meredith
Liverpool, England

As power gas is likely to come largely into use in the near future, it is interesting to recall that the first apparatus for its manufacture from coal dust, and for the recovery at the same time of sulphate of ammonia, was designed and patented by Ludwig Mond and built at Brunner Mond & Co.'s Northwich, England, works.

The advantages of using power gas can be summarized as follows: The cheapest quality of coal, even pit-head refuse, can be used; and consequently power can be obtained in addition to valuable byproducts without the use of expensive steam coal. Very little labor, and that of only an unskilled character, is required. The heating value of the gas is equal to, roughly, about 86 per cent. of the total heat energy contained in the fuel from which it is produced, and it can be obtained on a large scale for a mere fraction of a penny per 1000 cu.ft.

What this means will be realized when it is mentioned that one ton of rough slack will provide upward of 150,000 cu.ft. of power gas having a calorific value of at least 140 B.t.u. per cubic foot. The quantity of gas required to produce an indicated horsepower-hour in a large gas engine varies, but may be taken as being about 50 to 60 cu.ft.

One ton of low-grade coal, gasified, and used in a modern gas engine, will produce at least 2500 i.hp.-hr., or 2500 hp. for one hour. That is to say, a ton of this coal converted into power gas will produce about 500 per cent. more power than it would were it burned under a boiler in the ordinary way and the steam used to drive an ordinary reciprocating engine. Taking the price of slack at as high a figure as 12s. ($3) per ton, delivered, the fuel cost of an indicated horsepower-hour obtained by power gas would not exceed one-twentieth of a penny.

It has been pointed out, and rightly, by the advocates of the use of power gas that in every steam plant working with a variable or intermittent load a considerable percentage of the fuel is wasted. Some loss under this head is unavoidable, but it was early realized that the employment of power gas reduces such standby losses to a minimum.

In the early forms of producer the apparatus was provided with a water seal so arranged that the ash, which is the only residue, descended into the water, from which it could be easily removed. The process of combustion was carried out at a comparatively low temperature, which not only prevented the formation of clinkers but provided against the destruction of any of the byproducts.

This result was accomplished by blowing a blast of hot air and steam into the producer. The quantity of steam required when it was desired to recover the ammonia was equal to about 2½ tons for every ton of fuel gasified. Of this about two-fifths was afterward recovered. When the process was first used comparatively little attention was paid to the recovery of the ammonia, and the quantity of steam used in such case was about one ton for every ton of fuel.

In connection with the plant a regenerator was used, through which the gas passed. In this, part of the heat was transferred to the blast of air and steam on its way from the air-heating tower to the producer, the gas being cooled to a corresponding extent before it was delivered to the mechanical washer. Here a system of rapidly revolving dashers kept a fine spray of water passing through the gas, which not only reduced its temperature but cleansed it from dust and particles of carbon. From this washer the gas passed into an acid tower, where the ammonia content was removed by a weak solution of sulphuric acid with which it was brought in contact, in this manner forming sulphate of ammonia.

This solution was passed continuously through the stream of gas until it contained about 35 to 40 per cent. of sulphate. In order to provide for continuity fresh acid was introduced periodically and corresponding quantities of the sulphate liquor removed. This was then evaporated into solid form, after which it was crushed and sold as fertilizer, while the gas was passed into a cooling tower in which it was again thoroughly washed. Modern methods have improved to some extent on this process, but substantially it remains much as it did when it was first brought to the notice of engineers by Mr. Mond.

Origin and Development of the Ventilating Fan

SYNOPSIS — *The mine fan as we know it today had an ancient and humble origin. As the duty imposed by mine ventilation has increased, fan design has been improved to meet the requirements. Today several distinct types exist, each possessing peculiar advantages that render it particularly well adapted to certain circumstances.*

TO PROPEL air by mechanical means is a principle that dates back to antiquity. The methods at first used were primitive and not until comparatively modern times has any machine been devised that could be operated with sufficient economy to insure its commercial success. Also, the necessity for the development of mechanical ventilating equipment has only been brought about by the needs of the people of today. The various problems to which fans have been applied have only been developed during a comparatively modern time, and we find the application of fans, previous to this period, limited to the winnowing of grain and to the propulsion of cooling air in warm climates. Formerly these duties were accomplished by hand-operated fans of various designs, some of which still remain with us.

The most important fact in the development of the fan is that in the early days the only means of power were water, wind and hand. This, of course, limited the use of the mechanical equipment. Water-power was used to a certain extent, but due to the necessity of a favorable natural location it was little used for ventilation, although it was employed in the threshing industry. Wind-power was used quite extensively for various purposes, but since when the wind blew mechanical ventilation was not needed, it had no application so far as ventilation was concerned.

Hand-power was therefore used almost exclusively for mechanical ventilation. This, of course, had its application in warm climates only, and many of the methods used were unique and primitive. It is still quite a common sight in many places, even as near home as the West Indies, to see little negro boys sitting or standing behind members of the family, fanning continuously with large palm fans in order to keep the air in motion.

Another peculiar yet common means of creating an air current is to suspend a large piece of ornamental carpet or other fabric from the ceiling in the center of the room, and extending the full length. This fabric is fitted with a rod which passes through the entire length of the bottom edge. From the center of this rod a small cord is run through a hole in the wall of the room. A servant sits on the outside and slowly pulls the cord, thus swinging the entire curtain back and forth over the heads of the family, whenever ventilation is desired.

With the perfection of the electric motor, steam, gas and gasoline engines came forms of mechanical power not limited to a natural location or weather conditions. Thus there became available a constant positive source of power that has completely changed the early ideas of ventilation and made possible the high type of fan design with which we are familiar today.

It is not surprising that the machines used today for propelling air resemble strongly those used in the development of power from wind and water. The simplest of these machines, and one of the earliest, is the disk fan. This type, primitive as it may be, has a certain gap to fill in duties of fan performance, to which it is especially adapted, and where it gives better performance than even the most modern types of centrifugal machines. This duty is the handling of a large volume of air against a small pressure or against no pressure at all. Under this condition the disk fan will handle more air with less power than any other type, and for this reason we see it used almost exclusively for distributing the air in a room in order to produce a higher rate of evaporation on the skin of the occupants and thus produce a cooling effect.

As soon as a fan is used in connection with any pipe or other apparatus, however, a different condition arises. The disk fan has so much space for back leakage that as soon as it builds up a pressure ahead of it the tendency of this pressure to release itself will cause a flow of air back through the fan. This will increase as the static pressure ahead of the machine increases, until the back leakage equals the capacity of the fan and the blades simply revolve without effectively moving any air.

Disk Fan Will Handle Large Volume of Air

To overcome this, many forms of this fan have been devised, some of which produce positive pressures and seem to operate better when used against them; but in each case the pressure against which the disk fan will successfully operate is so small that for only the most simple and small installations are they considered advisable.

It was found in the use of the disk fan that even when the machine was producing a tremendous back leakage it still handled large volumes of air in a radial or centrifugal direction. In order to utilize this radially directed air, we find ourselves in possession of an entirely different type of fan, which has been called the cone fan. The name of this machine is derived from the cone-shaped plate at the rear of the fan that is used for directing the incoming air in a radial direction. This air is then picked up by the blades of the wheel and given a rotary motion. The momentum of the air, caused by centrifugal force, carries it through the wheel at a considerable velocity and produces a static pressure throughout the entire room in which the fan is placed. This room then becomes a plenum or pressure chamber in which sufficient pressure is created to force the required amount of air through the pipes or ducts leading from the fan to where the air is to be used.

This fan was a decided improvement over the disk

type in that it made it possible to produce a delivery of air against a greater resistance. The greatest pressure available, however, is equal only to the centrifugal pressure of the wheel, and this in turn is transmitted over so great a room surface that the entire velocity pressure or momentum effect of the air is lost and a comparatively small pressure is available for producing a flow in the outlet pipe or duct.

The constant demand for ventilation, however, called for a fan having a large capacity of air against a considerable pressure and requiring a minimum power to drive. A tremendous stride was made in this direction by taking the cone fan wheel and encasing it in a steel plate housing having two straight sides, with inlets at the center, and a scroll sheet encircling the rim, patterned after the well known logarithmic spiral. This machine is usually built with eight blades and produces a large delivery against a positive pressure. It requires only a moderate expenditure of power. Special designs of this fan have been known to operate against 16 to 18 oz. of pressure and still deliver a large volume of air, although the power consumption then became enormous. The most important fact that can be stated about this old reliable type of fan is that its efficiency is high.

Advantages of Steel-Plate Fan

The steel-plate fan is built with either curved or straight blades. The earlier fans were all straight bladed, and even now the high duty fans, such as pressure blowers, have straight vanes with which higher efficiencies are obtained. The theory is that to obtain the proper centrifugal force the force must be in a radial direction. Due to the fact that the wheel has some slippage, or gains on the air a little, the blades were curved back to allow the air to pass back on the wheel and still travel in a radial course. As the air nears the tip of the wheel the component of pressure in the radial direction is thus increased. This results in a greater capacity to overcome resistance, but the power required to operate it is about the same. The same results can be obtained with the straight-blade fan by driving it a trifle faster.

As soon as we pass from the steel-plate machine to the next and latest step in the evolution of the fan, as applied to ventilation, we have no longer a centrifugal fan, but an air turbine, differing so radically from the older types of paddle-wheel machines that the entire principle of air delivery is changed. This type is known as the multiblade fan, of which type the "Sirocco" is probably best known.

The multiblade fan develops an enormous air delivery, accomplishing this by means of a large number of shallow blades. As mentioned in the theory of the steel-plate fan, the air should have a straight radial movement from center to tip of the blade, and even in a perfectly frictionless case the maximum speed or velocity at which the air would leave the tip of the wheel would be equal to the peripheral velocity of the wheel itself. As the steel-plate fan, however, is only about 60 per cent. efficient, the maximum practical velocity of the air leaving the wheel is only 60 per cent. of the peripheral velocity of the wheel.

In the case of the multiblade fan, however, the movement of the air over the blades has three distinct stages. The first is when it is picked up by a lip or scoop at the inner edge of the blade. This lip picks up the air and starts it in a radial direction and at the same time produces a component pressure in that direction, which materially overcomes the tendency for back leakage. Once caught in this scoop the air is passed to the second part of the blade and into its second stage. The second part of the blade is practically radial and the rotation of the wheel causes momentum, due to the centrifugal force carrying the air into the third stage. The third stage is accomplished by decidedly curving the outer edge of the blade forward in the direction of the rotation of the wheel. It is evident that in the movement from the second to the third stage the air must travel faster than the wheel itself. Since the point of the blade is ahead of the radial point, the velocity of the air leaving the wheel must be greater than the peripheral velocity of the wheel itself.

The speed of the air can be increased by increasing the forward curvature of the blade until the theoretical limit is reached, at which point the air would leave the wheel at a velocity equal to twice the velocity of the wheel itself. Assuming that the multiblade and steel-plate fans are of equal efficiency, the practical velocity of the air in the multiblade fan would be 60 per cent. or twice the peripheral velocity of the steel-plate wheel.

It is evident, therefore, that for a certain air delivery, since the velocity is greater, the area required may be reduced. This permits decreasing the diameter of the wheel used, with a corresponding decrease in the size of the casing. Hence in this type we obtain a smaller fan, which will accomplish the same results as the older steel-plate machine.

So far, no account has been taken of the power required, and we can simply say that an air-horsepower is an air-horsepower in any case, and the power consumption would only be governed by the actual efficiency of the fan itself. The multiblade, however, has a particular advantage in the smaller percentages of restriction.

In conclusion, each of the fans considered in the foregoing possesses a particular adaptation to the various forms of ventilation, which makes each indispensable. Since conditions vary, no hard-and-set rule can be laid down for any given type, each particular case requiring individual attention to determine the proper fan required.

Generally speaking, the disk fan is suitable where a free delivery or only slightly restricted duty is required; the cone fan is suitable where the pressures exceed the limit of the disk fan and where price prohibits the use of a blower. The steel-plate and multiblade fans may be considered together as being applicable to ventilation in general, the preference being shown the steel-plate machine where space is of minor importance, and to the multiblade fan where space is of prime importance.

A saving of coal equivalent to 350,000 tons annually already has been effected by the Fuel Administration in its conservation campaign among the steam power plants, it is stated officially. This saving has been effected through the inspection of 300 plants. It is the intention to inspect each of the 250,000 steam plants of the country. The saving is declared to be the result of applying more efficient firing and operating methods.

Waste Due to Excessive Ash in Coal

THE J. G. White Engineering Corporation of New York, with the permission of the National Research Council, is distributing its report to Gano Dunn, chairman of the Engineering Committee of the Council, on "Clean Coal and the Effect of High Ash Upon Thermal Efficiency, Amount of Boiler Plant and the Amount of Transportation Equipment." Although this report is dated Jan. 16, 1918, so pertinent and timely even now are the facts set forth that it is here reproduced practically in its entirety. The report follows.

AS FAR as possible, the elimination of slate and other ash-forming impurities in coal, before delivery to railroad cars, will prevent serious economic waste in its utilization and transportation. It is difficult to completely cover this subject in a short report, because of the widely varying uses to which coal is put; but since the major portion of the coal mined in this country is used for the generation of steam, the actual proportion being about 67 per cent. of the total coal output, a discussion of this economic waste in the generation of steam will cover the most serious losses. The losses in other uses of coal will be similar, but of a different degree. These wastes may be briefly summarized as follows:

1. Reduction in Heating Value of Coal Due to Presence of Ash—The presence of ash in coal not only reduces its heating value, but as the percentage of ash increases the percentage of combustible lost with the ash also increases, thus greatly reducing the boiler efficiency and hence lowering the economic value of the coal. (See Fig. 1.)

2. Increase in Coal Consumption for a Given Power—The reduction in boiler efficiency greatly increases the amount of coal that must be purchased to produce a given amount of work. This is a direct financial loss, since the consumer is not only paying for unnecessary ash, but is losing good fuel which is carried off through the boiler grates with the excessive ash. (See Fig. 2.)

3. Influence of High Ash on Boiler Capacity—The presence of excess ash seriously reduces the boiler capacity, because sufficient coal cannot be burned on the grates to do the necessary work. This is possibly the effect which is felt most seriously by the consumer, because he finds it impossible to get sufficient steam from his boilers to do the work demanded of them and is compelled either to reduce his output or purchase additional boiler capacity. (See Fig. 3.)

4. Increase in Transportation Equipment Due to High Ash—About 85 per cent. of all the coal mined in this country is carried by the railroads, hence unnecessary ash means an unnecessary task imposed upon these carriers. Each per cent. of avoidable ash adds to the work of the railroads about 5,000,000 tons of unnecessary freight per annum. Some shipments of coal contain 18 or 20 per cent. noncombustible. Such coal requires 65 per cent. more cars and locomotives than a reasonably clean coal of say 10 per cent. ash. (See Fig. 4.)

The heating value per pound of combustible (that is, ash- and moisture-free coal) of all coals approximates 15,000 B.t.u. There are some variations from this figure, but as a general average it is about correct. The variation in the heating value of coal is consequently largely due to the varying percentage of the ash—the effect of moisture being less important except in a few cases of unusual moisture content. If we could obtain an ash-free coal, we should expect a heating value of about 15,000 B.t.u. per pound. The heating value by test of any commercial coal is reduced approximately in proportion to the increase in the percentage of ash, but its value as a heating agent is reduced more rapidly.

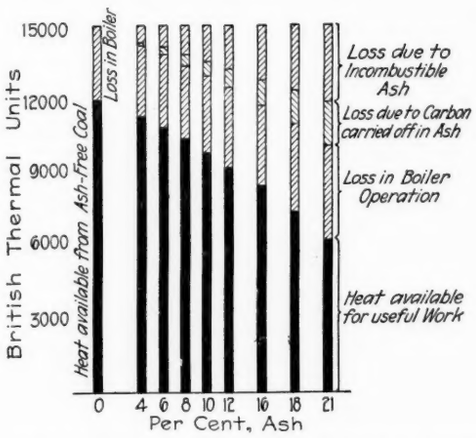


FIG. 1. REDUCTION IN HEAT VALUES DUE TO PRESENCE OF ASH IN COAL

The percentage of ash has a distinct influence on the boiler efficiency. As the quantity of ash increases in percentage, it becomes more difficult for the fireman to completely burn the combustible. With a low percentage of ash and good firing we expect the ash removed from the boiler to contain approximately 25 per cent. of its own weight of unconsumed combustible. As the percentage of ash increases, the percentage of combustible lost in the ash also increases rapidly. With coal containing a high ash percentage, it is rarely possible to reduce the percentage of combustible in the ash to less than 50 per cent. of the weight of the ash.

This reduction in heat value is shown diagrammatically for varying percentages of ash in Fig. 1. The column at the left represents the heating value of ash-free coal, those at the right the relative values for coals containing varying percentages of ash. The upper stratum of each column represents the loss due to the fact that the ash is incombustible. The second stratum shows an additional loss due to the presence of unconsumed combustible contained in the ash taken from boiler grates. The next stratum represents the loss due to the fact that steam boilers cannot be operated at 100 per cent. efficiency. The lowest stratum, therefore, represents the relative commercial values of coal containing varying percentages of ash.

On the basis of Fig. 1, Fig. 2 has been plotted. This shows the pounds of fuel required to produce one boiler horsepower with coal of varying percentages of ash with careful operation. It will be noted that for the best coal with 4 per cent. ash there is required approximately 3 lb. of coal per boiler horsepower-hour, and that with

10 per cent. ash, less than 3½ lb. is required. Beyond this point the increase is rapid until for 21 per cent. ash the coal consumption amounts to 5.45 lb. per boiler horsepower-hour; 80 per cent. more than with 4 per cent. ash and about 60 per cent. more than with 10 per cent. ash.

The increase in the ash content of coal seriously reduces the capacity of steam boilers. The excessive quantity of coal required to deliver a horsepower with poor coal, as shown by Fig. 2, makes it impossible to consume sufficient coal on the grate to deliver the necessary boiler horsepower. Central stations today are in a serious condition because they find that their station load is increasing, but that the quality of coal has much decreased, necessitating the operation of a larger number of boilers. They find that whereas their boiler houses, two or three years ago, were of sufficient size to handle all ordinary increase in power demands, now, because of the poor quality of coal, they provide the steam necessary to carry the station load only with extreme difficulty.

Up to within the past two years it was considered good practice to operate central station boilers at 200 to 250 per cent. of their rated capacity during peak periods. In the same stations it is now difficult to operate the boilers at more than 150 to 160 per cent. of their rating, and sometimes at even less. It is therefore necessary for these stations to place more boilers on the line, and in many cases they have been compelled to purchase additional boiler units at unusually high prices.

This phase of the subject is illustrated in Fig. 3, which shows the number of 500-hp. boilers required to generate 300,000 lb. of steam, equivalent to a peak load of 15,000 to 20,000 kw. With coal containing 6 per cent. ash or less 8 boilers can be made to do this work. If the ash runs higher than 6 per cent. 9 boilers must be operated, above 10 per cent. 11 boilers would be required, and above 18 per cent. 19 or 20 boilers are required. This situation is so bad that practically every large central station today has no spare boiler capacity, unless spare boilers have been purchased and installed within the past two years. They are compelled to refuse new business and must often keep boilers in service that should be undergoing cleaning and furnace repairs.

The effect upon industrial plants is similar to that

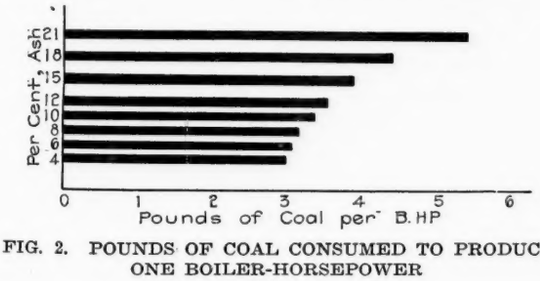


FIG. 2. POUNDS OF COAL CONSUMED TO PRODUCE ONE BOILER-HORSEPOWER

experienced by the central stations, but in a different degree. Industrial plants do not operate their boilers at the high ratings experienced in central station practice, but they do not as a rule carry so large a percentage of spare boiler equipment as do the central stations. They therefore find it necessary to operate their entire boiler equipment, or curtail production, and their boilers are kept in service for longer periods than is good practice. It is impossible to take the boilers out of service long enough to properly clean them from scale and to properly repair baffles and brickwork in the furnaces. The consequence is that the boiler efficiency is seriously reduced until they are in such poor condition that they must be shut down for cleaning, at the expense of production. With reasonably clean coal this situation would not exist.

There is a difference between preventible and nonpreventible noncombustible in coal. The nonpreventible

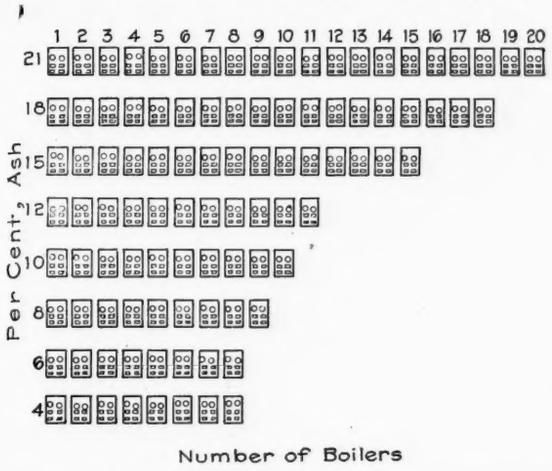


FIG. 3. NUMBER OF 500-HP. BOILERS REQUIRED TO GENERATE 300,000 LB. STEAM PER HOUR

ash is so thoroughly incorporated with the structure of the coal that it cannot be separated mechanically. This minimum ash content differs in each mine.

By preventible ash is meant the slate and other impurities which can be separated by careful preparation. This minimum ash varies from as low as 2 per cent. in some cases to as high as 33 per cent. in other cases. The average for the country is probably about 9 or 10 per cent. The percentage of ash in the coal from various states, together with the output for the year 1915, is given in Table I. Over half the coal mined shows an ash analysis of 9 per cent. or better. The percentage for the country if averaged in proportion to each state's

TABLE I. TONS OF COAL MINED IN 1915 AND THE PER CENT. OF ASH IN THE COAL FROM THE PRINCIPAL COAL PRODUCING STATES

	Coal Mined per Annum Tons (2,000 Lb.)	Average Per Cent. of Unavoidable Ash
Pennsylvania	158,000,000	9
West Virginia	77,000,000	7
Illinois	59,000,000	13
Ohio	22,500,000	10
Kentucky	21,400,000	9
Indiana	17,000,000	11
Alabama	15,000,000	12
Colorado	8,600,000	16
Virginia	8,100,000	8
Iowa	7,600,000	13
Kansas	6,800,000	13
Wyoming	6,500,000	6
Tennessee	5,700,000	15
Other states	29,500,000	12
Average for the country		9.9

production is about 9.9 per cent. We may therefore consider 10 per cent. as a fair average for clean coal for the entire country.

There will be mined this year probably 600 million tons of coal, and 85 per cent. of this coal will be transported by the railroads; hence, for each per cent. above the average 10 per cent. the excess ash will add to the work of the overburdened railroads 5,000,000 tons of useless freight.

Fig. 4 illustrates diagrammatically the increased trans-

portation equipment necessary for handling coal with a high percentage of ash. The number of cars shows the relative number necessary to carry coals of varying degree of ash. The shaded cars represent the percentage of carrying capacity which has heating value, the light cars, the useless freight. It will be noted that in some shipments as much as 40 per cent. of the cars carry worthless material, or in other words coal containing 21 per cent. ash requires 65 per cent. more cars than coal containing 10 per cent. ash.

In all these charts it will be noted that the trouble

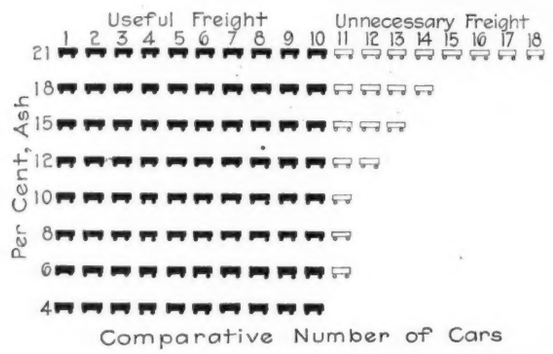


FIG. 4. INCREASED CARS NECESSARY FOR TRANSPORTATION OF HIGH-ASH COAL

from ash is not excessive until we pass 10 to 12 per cent. content. If, therefore, we might limit the percentage of ash to the average of 10 per cent. we would reduce our transportation equipment to a practical minimum; we would be able to operate all boilers at a reasonable efficiency and would reduce the number of boilers operated to a little over one-half of the number required for the dirty coal (that is, 18 per cent. ash or over) besides making a saving in money that cannot be accurately estimated.

Stripping Coal with a Grader

By C. P. Burton
Aurora, Ill.

A method of stripping coal which is rather out of the ordinary, though it is proving successful, is being employed by H. H. McDowell, of Pleasanton, Kan., who is stripping coal for the Star Coal Co., of Kansas City, at Worland, Mo. The removal of overburden from the coal is being accomplished with the aid of a Western elevating grader.

The land to be stripped is a rectangular tract of 80 acres about 700 ft. long. It would be hard to find a more difficult piece of earth-moving for an elevating grader. The average cut in the pit now being stripped is 16½ ft. with a maximum of 21 ft., and the material is tough gumbo and hard shale, overlying 35 in. of coal.

For stripping, Mr. McDowell is using a Western standard elevating grader, drawn by a Reeves tractor, loading into Western 1½-yd. dump wagons, three horses to a wagon. The cut is being made with one side perpendicular and the other, toward the adjoining box pit, with a slope of ½ to 1. He finds eight wagons the proper number for economical work, and under favorable conditions can move from 750 to 800 cu.yd. of material in a 9-hour day.

In his plans Mr. McDowell has divided the remainder of the tract into five box pits about 700 ft. long. The first of these pits, now being stripped, is 72 ft. wide at the top and 60 ft. at the bottom. The next pit has a bottom 40 ft. wide; the third, 75 ft.; the fourth, 40 ft., and the last, running to the edge of the property under lease, is 60 ft. wide.

These five box pits will not be stripped in continuous succession but alternately, the two inside pits, each 40 ft. wide at the bottom and 700 ft. long, being left until the last. When he comes to strip the two inside pits, by using a longer elevator on his machine he expects to be able to cast fully two-thirds of the material. This will be an inexpensive operation and will reduce his yardage cost materially.

Legal Department

Dangerous Places of Work.—The general rule of law that an employer is bound to use a reasonable degree of care to provide his workmen with reasonably safe places of work has no application to classes of work consisting in making a dangerous condition safe, as where a mine timberman undertakes to reset timbers which have been knocked down by a runaway coal-cutting machine and is injured by a fall of slate while replacing a prop. (Kentucky Court of Appeals, Charles vs. Elkhorn Mining Co., 200 Southwestern Reporter, 461.)

Taxation of Coal Lessee's Interest.—An instrument granting the right to mine coal underlying land within a specified period and providing for the payment of semi-annual royalties conveys a taxable interest in the real estate, under the laws of Illinois, and not a mere license. By express provision of an Illinois statute the right to mine may be conveyed by deed or lease, and such conveyance is to be regarded as so separating such right from the land as to make it separately taxable. (Illinois Supreme Court, Simmons Coal Co. vs. Board of Review of Fulton County, 118 Northeastern Reporter, 753.)

Negligence of Mine Foreman—A Pennsylvania coal-mining company was not liable for injury to a miner resulting from a fall of slate from the roof of a passageway being constructed under the supervision of the mine foreman, where the company had no knowledge as to the existence of the defective condition of the roof and that condition had not existed long enough to charge the company with constructive notice of it, although the mine foreman's attention had been called to the fact that the place was unsafe and he failed to remedy it or to provide warnings against it. The mine foreman being given full charge of the inside workings under the Pennsylvania Bituminous Coal Mine Act of June 11, 1911, the operator is not liable for negligence in the performance of the foreman's statutory duties. (Pennsylvania Supreme Court, Cossette vs. Paulton Coal Mining Co., 103 Atlantic Reporter, 346.)

Liability for Injury Caused by Roof Fall.—If plaintiff, who was injured through fall of rock from a roof under which his duties required him to pass, was a foreman in charge of the work at the particular place, with full authority and charged with the duty of doing all things necessary to make the place reasonably safe, by timbering or by removing loose earth, he is not entitled to recover. But if, as claimed by him, he was merely a timekeeper, and it was the duty of other employees to look after the safety of the mine, and to remove all obstructions and dangerous elements, than he is entitled to recover damages to cover any injury arising through failure of the defendant operator to provide him with a reasonably safe place in which to work. (Oklahoma Supreme Court, Sandals vs. Mizpah Mining Co., 168 Pacific Reporter, 808.)

The Coal Industry's Part in the War

BY GOVERNOR JOHN J. CORNWELL
Charleston, W. Va.

SYNOPSIS — *Substance of an address delivered by the Governor of the State of West Virginia at a large meeting held at White Sulphur Springs, W. Va., on Sept. 15, for the purpose of stimulating coal production.*

IN THE incipient stages of our war preparation the fuel situation had not become acute and, indeed, on the surface there was no indication that it would become so acute as we found during the winter months that followed. Up to a short time before that the coal market was running wild and was uncontrolled. Just immediately prior to that the price had been fixed by the President, and there was no little dissatisfaction manifested among some of our people, either openly or quietly. The seriousness of the war situation had not then dawned upon the majority of our people, nor had they got a glimpse of what tremendous efforts our Government and our people were to make to bring this war to an end.

Many people thought all we would do in this war, at that time, would be to loan some money to the Allies and furnish them supplies. Others thought we would go further and send our fleet abroad, but despite the fact that our first registration had occurred in June, and at that time the great cantonments were being completed and arrangements were already on foot to take into them the first increment of the selective army, notwithstanding all this there were few people, indeed, who imagined that within one year from that date we would have in France nearly two million soldiers; that we would have there the biggest port in all Europe for our exclusive use, a port built and established with American men, American material and planned by American engineers. Nor did they imagine that we would have built, within one year from that, more than 600 miles of double-track standard-gage railroad over there; that 2000 of our big locomotives would be operating on that railroad and that 40,000 American railroad men would be astounding the European people with their energy and their skill in operating and maintaining the railroad. Nor did they see that more than 150 great shipyards, reaching all the way from Portland, Ore., and Seattle, Wash., clear around to Portland, Maine, would be dropping ships into the water every few moments at the end of that year.

ASTOUNDING RECORD MADE IN SHORT TIME

But all these things have come to pass in one short year. Today we see and know two things: First, that the accomplishments of the past eighteen months are record-breaking. No country under the shining sun ever made such stupendous preparation in so short a time. In fact never before in the history of the world did any country attempt to fight a war on such a large scale 2500 miles from its base of supplies. That this country is not only well along in its preparation but that it is actually a factor, and a very great factor, in the struggle, the story of the fighting over there that comes to us day by day fully attests.

Our preparation has been an achievement of which the country may be proud, despite some mistakes which are inevitable always under such conditions; but the valor, the courage, the dash and the tenacity of our soldiers in France constitute and will continue to make a record superb, glorious and imperishable, of which every American will be proud as long as he lives.

ONLY THOUGHT NOW IS TO WIN THE WAR

Today we understand much better the task that lies ahead of us than we did in July, 1917. Our attitude is quite different than it was at that time, when many coal operators deeply resented the Government's interference in the price of coal, believing that they should be left to sell coal for all they could get and ship it wherever they pleased. Today we realize that monetary profit is a subordinate, a really inconsequential thing, except as it may enable one to give financial support as well as support in the way of furnishing coal and other material.

I doubt whether all of you even now comprehend the danger that confronts the country the coming winter from the fuel standpoint. It may just as well be understood that if there is not enough fuel to keep all the factories and all the mills going (and it is certain that there will not be), that the Government must and will close all those that are not absolutely essential to the support of the war program. Indeed in this crisis no man has any right, any moral or legal right, to go on using men and consuming fuel and material manufacturing luxuries and non-essentials. The country must be placed on a strictly war basis, and while that is going to cause inconvenience, cause embarrassment and perhaps cause loss to some people, it is inevitable. We can't win this war even now with part of our people working at it and the rest of the people grabbing for labor and material to make non-essentials for profit. So the Government will determine—must determine—who is to consume your coal.

What does a shortage of coal mean to the Government? What does it mean to our Army? What does it mean to our boys from West Virginia who are over on the firing line in France? It means the Government will not be able to get all the ammunition over to Pershing and to our boys which they need, and if we are short of ammunition it means a greater loss of life. To repeat the language of a prominent speaker: "From now on it is munitions against casualties. If you keep this in mind, you will have the background for the sternly drastic attitude of the Government during the next six months in clearing the way for filling Pershing's orders.

"We are facing a catastrophe. It is not one of those catastrophes which make such a noise that every one knows when it happens. It is a silent tragedy. We can not fill Pershing's orders in full, because the United

States can not make sufficient steel this winter. A shortage in steel results almost entirely from lack of coal. Keep this in mind and then look forward to the events of the coming spring. We shall have the drive. We shall succeed, but some time in February or March, or whenever the time has come, General Pershing will sit down with a pencil in hand, will figure up the exact deficit in the filling of his orders for munitions.

"With military formulas now well recognized he will figure in place of those munitions how many extra men must be put into the battle to be killed. This is no fanciful statement. It is now possible to treat the question of munitions or of casualties as interchangeable quantities. So many thousand American youths must be thrown into the hopper for every thousand tons of munitions which are short."

Why Coal Production Must Be Speeded Up

My God, men! What an awful thought that is! Do you get it? Can you grasp that thought and carry it back to the men in the mines and get them to realize that we are already short of coal; get them to realize that that shortage of coal will prevent our Government from filling Pershing's orders for shells and bombs and hand grenades; get them to realize that in place of that ammunition and these shells the Government can't supply, more men, more boys must be put into the army to be killed—all because we have not produced enough coal? Can you bring the men who dig the coal to understand this and to realize the seriousness of it?

If the West Virginia miners only understand these things I know they will dig and load coal as they never did before, for they will be working to save the lives of their own sons. The man who would not work longer and harder under these circumstances does not deserve to be called a man.

Most, if not all of you, I take it, come from the fields that produce the smokeless coals, coals used by the Government itself direct on its ships. When the Government clamors for more coal and asks for the speeding up of production, some of your employees and some of you may wonder where they take all the coal you give them and what they are doing with it.

Well, when one knows the increased number of naval vessels that consume it, that is easily understood. The story of the extension of our navy is not being widely told, but it is an amazing story. From some 50,000 men in the American navy when the war began the force has expanded to more than 600,000. From 250 fighting ships of all classes it has expanded to more than 2000. The Navy Department is building right now more destroyers than there were in all of the fleets of the world when this war began. In 28 days after the declaration of war our speedier ships reported for duty alongside with the English ships in the North Sea, and they circle the waters of Germany by the hundred. So the demand of the navy for coal is tenfeld what it was when war began. Then in addition to that the Government itself is producing a merchant fleet at an unprecedented rate.

I know there was much delay, apparently, much discussion and no little criticism of the fleet program—I mean the merchant fleet program—in the beginning. But you know what is going on now. American shipyards are producing tonnage faster than England, though England lives by ships and has been the great maritime and the great shipbuilding country of the world. We have already outstripped her. The new merchant ships need coal and they must have it, otherwise it were better they had never been constructed. Your smokeless coals, therefore, are absolutely essential and directly or indirectly essential to the Government's program.

And the demand will increase. It is going to get greater and greater. Every little while a new battleship or a new destroyer is placed in commission. Every few minutes a new merchant ship slides down the ways, takes to the water and is quickly fitted up and commissioned. That must go on and on, for if the German machine does not crack and crack and break in the meantime, one year from now instead of having a million and three quarters of men in France we will have an army of four or five million men over there.

To take them over, sustain them and supply them, our merchant fleet must be more than doubled. When that happens the demand upon you for coal will be doubled, at least be very greatly increased. Of course, many of these new vessels are fitted up as oil burners. Every effort is being made to relieve the pressure as much as possible upon the coal men, but that pressure will get heavier and heavier.

Now, how are you going to meet it? Operators have said to me, "How can I produce more coal when you are taking men out of my mines for the army?" I am not unappreciative of your problems. I am not unaware that you have a very difficult one, but it is unquestionably true that all kinds of production can be greatly increased by speeding up, if all the people can be made to realize that that is necessary. Canada gave an illustration of what can be done in a crisis. Canada sent 600,000 men to England, financed the expedition and loaned money to the mother country in the bargain, and then the Canadian people at home turned to and produced 25 per cent. more than ever before. When Canada sent 600,000 men overseas, that is equivalent to this country sending 9,000,000 men. To equal Canada's effort we should send 9,000,000 men to Europe and then increase our production 25 per cent. Are we capable of doing it?

Patience and Precept Absolutely Necessary

It is true that Canada's production was largely agricultural and that the men on the farms and in the vast wheat fields were not hampered with an eight-hour day contract. But my thought is that you men who own and operate these coal mines can do a great deal toward impressing upon the men who dig and load coal the seriousness of this situation, and can do a great deal toward inspiring them to make whatever sacrifice may be necessary to meet it. I realize that you can not do that by merely issuing orders. I realize that you will have some unreasonable people to contend with and some stubborn and vexatious cases to handle. But there are two things that will go a long way toward getting the desired result. The first is patience, infinite patience. The second is a good example.

The superintendent or the mine boss who has all the patience of Job, who will keep sweet all the time and be reasonable, having regard for the rights and feelings

of other people, for the men who work, that man can get results, I believe. If he will speed himself up and double his own efforts, that too will, in my judgment, have a good effect. A good example is the best of all teachers.

We have heard a great deal about the shortage of labor during the past year. As a couple more million men are drawn into the army we will necessarily hear a great deal more about it. The labor shortage would have been greatly relieved at any time within the past year and would be greatly relieved now, were labor stabilized. The turnover in labor has been something tremendous.

The payment of high wages at ammunition plants and other places where there were rush jobs have attracted labor from normal employment. The unsatisfactory living conditions cause many of the men to leave the job which they had traveled a long way to obtain. Fully 20 per cent. of the labor of the country has been continuously and perpetually riding on railroad trains or shifting about from place to place. While that has not been true in the coal fields to the same extent, it has had its effect there, I am quite sure.

There are several reasons to hope that this part of the trouble will be gradually eliminated. First, the Government has established its labor bureaus and is gradually eliminating the private employment agencies which were encouraging the shifting of men from one plant or place to another. Second, with the completion of the construction of a great many plants and the putting of them into operation, thousands of men will be released. Third, the closing of plants of non-essential character, which is inevitable. Fourth, the increased number of women who will take positions in many industries and factories of the men who will go into the army or take up work which a women can not do.

Good Living Conditions Essential

But there is something the employer can do to stabilize labor, something many of them have already done, those who are holding their labor. That is, to make the living conditions just as tolerable as is possible; make them not only tolerable but attractive, so that if a man has a family he will be willing to continue to reside there and raise that family with an opportunity to educate his children and live amid attractive surroundings. Therefore, should not the operators and the state join hands in working out a program for the future where the health and the happiness of the worker are subjects of especial attention?

In the years that have gone the coal operator had a harder time to find a market for his coal at a profitable price than he had to find men to dig the coal. The West Virginia operator has had a peculiarly hard lot. Notwithstanding he had the best coal in the world, he has been discriminated against by railroad differentials and has been unfortunate, too, because the operators of other fields have been able, through their more active or more unscrupulous press agents and congressional representatives, to put the West Virginia operator in an unfavorable light before the public. Therefore you have had your handicaps to bear and you entered this war under very unfavorable conditions. Your vigorous and patriotic support of the Government and your cheerful acquiescence in every regulation has, however, put you on a new footing before your fellow citizens and before the officials of your Government.

This war has cast a tremendous responsibility upon you which you are meeting in a patriotic way. You will not be able to perform miracles, but by patience, through energy, through diplomacy and through a willingness to match the sacrifices of the men on the other side of the water, you will meet the situation as far as human effort and human ingenuity can meet it. The country's demand and its need for coal is unbounded and will continue to be during the war. There will simply be no limit to it. On the other hand, the limit of production of steel and of munitions and supplies for our army will be the limit placed by the amount of coal that can be produced.

Today there is but one thing before us—*win the war*, save the lives of as many of our men as possible and get them home as soon as possible. Of the vast army at home none in it can do more to speed up that great day when our boys return triumphant than the coal operators and the coal miners. Stop the supply of coal and disaster will befall our army. With that situation confronting you we have a right to expect every coal man to do his duty.

Generation of Electrical Energy

Much confusion exists about the term "generation of electrical energy." Strictly speaking, this expression is incorrect because "energy" can neither be created nor destroyed. Energy, as defined technically, means capacity or ability to do work. There is a certain definite amount of energy in the universe and this total amount can be neither increased nor decreased.

Hence, when one speaks of the "generation of energy," what he really means is the transformation of energy. Thus, while energy cannot be generated, it can be changed from one form into another. The energy of a stream of water can be transformed into electrical energy by the application of a waterwheel and a dynamo. But the latter machine has not created electrical energy; it has, due to the assistance of the waterwheel, merely changed the kinetic energy of the falling water into electrical energy.

Now consider the generation of energy from coal. The energy in coal is due to heat transmitted to it by the sun centuries ago, and which has been stored up in this material ever since. Now when this coal is burned under a boiler, heat energy is derived which is transferred to the water in the boiler. Thus steam is generated. Considerable of this heat energy is wasted through radiation losses, losses up the stack, and by condensation.

Next the heat energy in the steam is carried to the engine or turbine. In this machine this heat is transformed into mechanical energy. Then in the electric generator, which the engine or turbine drives, the mechanical energy is again transformed, but this time into electrical energy. Finally, the electrical energy is again transformed into heat energy, within some electric-lighting device, in the conductors which carry the electric current, or by friction of some sort or other. Or it is changed into mechanical energy through the medium of electric motors.

News From the Capitol

By Paul Wooton

Summary of Traffic Conditions

A Fuel Administration summary of the traffic situation is as follows:

"Eastern Region—Coal car shortage in Ohio due to scarcity of power, which is being corrected. The regular car supply at some other points now having the attention of the Car Service Section. Some coal congestion in New England, both water and all-rail, due to lack of unloading facilities.

"Tidewater—Vessel supply more than ample; transportation conditions good.

"Lake Situation—Vessel supply interfered with by storms and ample coal at docks.

Coke—Car supply good. Shortage of labor limiting production, especially in the South.

The Navy Department's report says: "Coal supply better than had been stated and indications are that the Department is starting winter months with better protection in regard to supplies on hand than last year."

Shows Unjust Discrimination in Coal Mining Industry

Unjust discrimination between competitors within the coal mining industry by the present revenue law are set out clearly in a tabulation submitted to the Senate Finance Committee by Rush C. Butler, general counsel for the National Coal Association. The tabulation, which shows the capital of the reporting companies per ton of annual production, based upon the returns made to the Treasury Department, is as follows:

	Companies Reporting			Capitalization per Ton Produced			
Capital per Ton Production	Number	Per Cent. of Total	Their per Cent. of the Production Reported	Low	High	Average	Exemption on Basis of 10 per Cent. of Capitalization
Under $1	41	10.38	19.6	$0.047	$0.963	$0.65	$0.065
Between $1 and $2	156	39.49	27.6	1.022	1.968	1.43	.143
Between $2 and $3	105	26.58	21.9	2.00	2.957	2.14	.214
Between $3 and $4	34	8.61	6.3	3.072	3.979	3.46	.346
Between $4 and $5	25	6.33	13.8	4.21	4.887	4.65	.465
Over $5	34	8.61	10.8	5.04	13.93	8.21	.821
Total	395	100.00	100.0	.....	.....	$2.72	.....

Capitalization of companies in first three groups, representing 69.14 per cent. of production, is $1.42 per ton.

Capitalization of companies in last three groups, representing 30.86 per cent. of production, is $5.88 per ton.

Companies reporting produce 143,894,309 tons.

Mr. Butler also brought out the following points: "The reasons for an extraordinary exemption on the mining industry are numerous, but two will suffice at the present time: First, because the mining industry is extra-hazardous and only invites capital that is willing to take extra chances, which, in turn, is entitled to a larger percentage of profit; and, second, the extra exemption should be allowed for the coal industry, because of the fact that the coal industry pays a higher percentage of its net profits by way of a Federal tax than any other industry. I cannot make this statement, however, authoritatively, but I have been so advised by representatives of the Treasury Department. It would, therefore, seem that if all industries are to be on a comparative basis, there is just occasion for the Treasury Department's recommendation that a special exemption applicable to the mining industry be made."

A brief signed by J. H. Wheelwright and J. D. A. Morrow, president and secretary respectively of the National Coal Association, and by its committee on Revenue Legislation, has been submitted to the Senate Committee on Finance. The brief covers: (1) A proposed revision of the definition of invested capital; (2) a proposal that borrowed capital be not excluded from invested capital; (3) a proposal that the excess of current cost over and above prewar cost of installations of plant, equipment, etc., be amortized at the rate of 50 per cent. per annum for a two-year period.

The brief also urges the favorable consideration of the Treasury Department's recommendation, which is referred to above by Mr. Butler, for the following reason: First, that the coal industry is said to have paid a higher percentage of its net income by way of Federal taxes for the year 1917 than any other industry, thus clearly indicating that the coal industry as an industry carried more than its share of the burden of Federal taxation; second, that the hazards of the business are relatively much greater than the hazards incident to almost any other industry.

Berwind-White Co. Receives License

The settlement of the license question with the Berwind-White Coal Mining Co. is the subject of the following announcement by the Fuel Administration:

Owing to the fact that a vast majority of the coal sold by the Berwind-White Coal Mining Co. is produced by that company itself, or by companies which it controls, it was under the impression that it was not required to obtain a distributor's license under the President's proclamation of Mar. 15, 1918. When the company's attention was called to the fact that under such proclamation licenses were required by all companies which distributed any coal whatever which was not produced by themselves, it promptly applied for a license.

After a full investigation this license has now been granted, upon condition, however, that the company refrain from charging any purchasing agent's commissions on any coal distributed by it prior to the date on which such license is granted, and the company is preparing reports of all coal, other than that produced in its own mines, which it has distributed since Apr. 1, 1918, so that its distribution business may be subject to the same control, regulation and investigation that it would have been if the company had applied for and obtained a license on that date.

Would Ship American Coal to Italy

Great Britain will be unable to furnish Italy with as much coal this winter as was the case last winter, according to information presented to the Senate by Senator Owen of Oklahoma. The fuel situation in that country is represented to be so desperate that Senator Owen urged, on the floor of the Senate, that coal be sent from this country.

Must Have Larger Coke Output

Coke production in the United States must be increased at once by a minimum of 30,000 tons a week if the war program of the Government is to be carried out. A greater increase is desirable, and may soon be needed, but the call for 30,000 tons more each week is immediate and insistent. It is a literal fact that failure to supply this increase is going to be paid for in American lives in the big drive of the allied armies against the Germans.

According to figures given by W. S. Blauvelt, Director of the Bureau of Coke, United States Fuel Administration, the coke capacity of the United States is 1,350,000 tons weekly. Production is running at approximately 1,170,000 tons weekly and the minimum requirement is 1,200,000 tons weekly. Chief among the factors of the shortage is the labor situation in the coke yards, to which is ascribed three-quarters of the deficit.

More labor is needed, and 100 per cent. efficiency from the labor now employed is likewise required to meet the situation. Operators in the Connellsville field, at a recent meeting, adopted a resolution that "furnaces shall not bank" for lack of Connellsville coal and coke. This has been followed by a general appeal to coke workers throughout the country, by means of pay envelope folders, to make this resolution apply to every coke oven in the United States.

Labor is short in many coke yards, and in some places it is only by the voluntary exertions of other workers that coke can be loaded at anything like capacity. An instance of this occurred recently at the yards of the Wisconsin Steel Co., in Benham, Ky., where about 200 men engaged in other lines volunteered for work one Saturday evening and loaded about 1000 tons.

In other cases there is failure to load at anything like capacity because full-time service is not being given. It is hoped to impress workers, in such cases, with their patriotic duty to work steadily every week, just as it is hoped to recruit men for the depleted payrolls in other yards.

The importance of larger coke production, and the patriotic obligation resting upon every coke worker, are to be driven home wherever possible. The facts in the coke situation speak for themselves. It is a simple truth to say that more good coke means more steel, more shells and fewer casualties. Iron depends upon coke, which is another way of saying that the shells and guns, the helmets and bombs used by our soldiers depend upon a steady and ample supply of coke. So do the ships to carry these supplies abroad, and so do the rails and locomotives which carry the supplies across France to the battle front.

In the case of byproduct coke, there are additional essentials which depend upon large and continuous output, for byproduct ovens supply the bulk of the explosive material used in American shells, in addition to tar for surfacing military roads or the roofing of military buildings, and the bases for many medicines and disinfectants used in tremendous quantities in military hospitals.

High Output in Kentucky, Tennessee and Georgia

For the second week in succession bituminous coal production was broken in the Harlan field of Kentucky, Tennessee and Georgia during the week ended Sept. 21, according to a report received by James B. Neale, Director of Production, U. S. Fuel Administration, from Howell J. Davis, Production Manager for the district. Output during that week was 338,820 tons, an increase of 10,286 tons over the previous week, when the record was 328,534 tons. This latter figure was itself a record, the previous high mark for the coal year having been 306,941 tons.

Garfield Appoints Director of Education

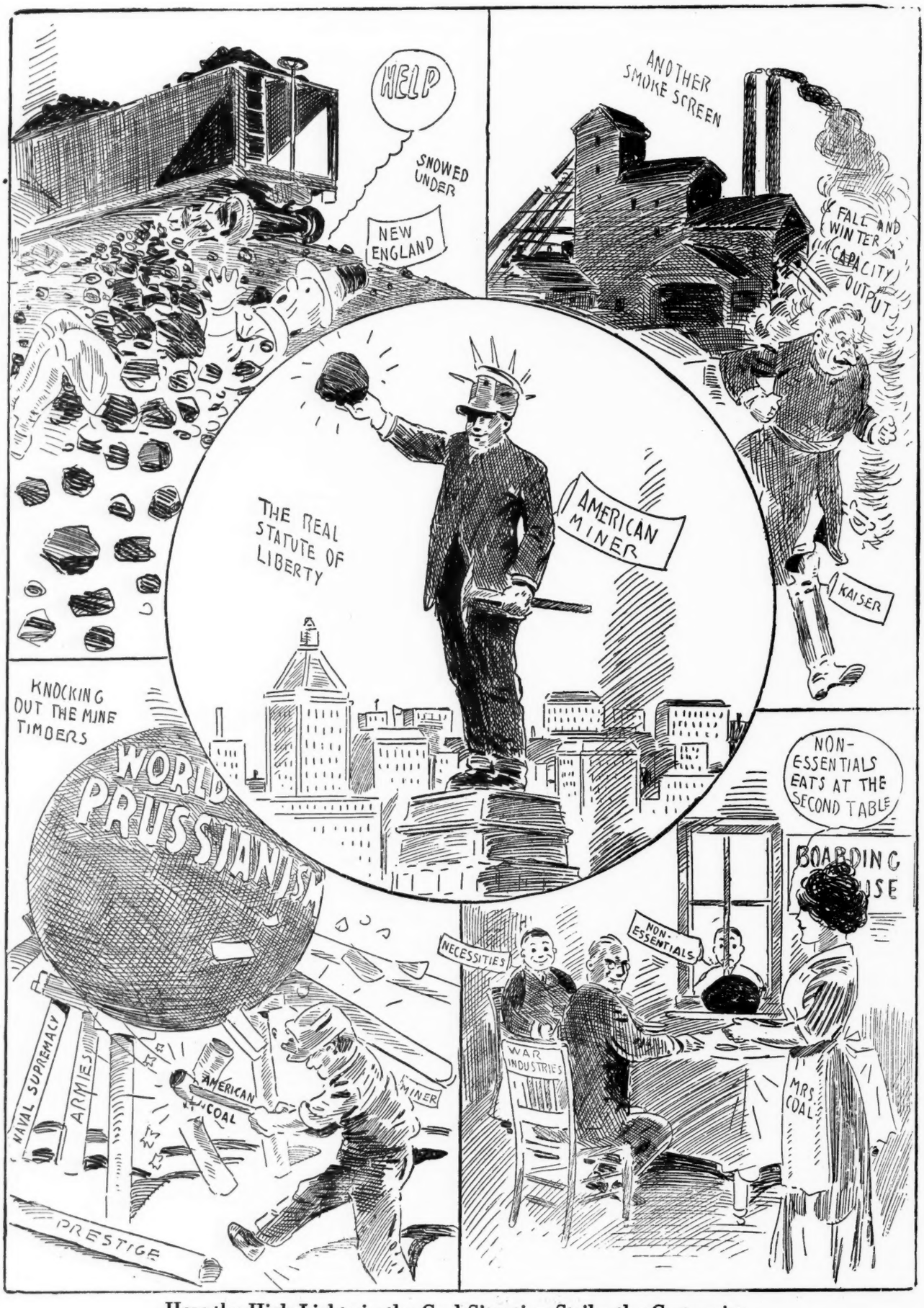
Fuel Administrator H. A. Garfield, on Oct. 3, appointed C. E. Persons, of San Francisco, Director of Education of the Fuel Administration. Mr. Persons has been connected with the Western Division of the Associated Press for seven years, and for the last three years has been news editor of that division. At the request of Dr. Garfield, the Associated Press has released Mr. Persons for this work.

No exception to the lightless night order is to be made during the Liberty Loan drive, the Fuel Administrator has ruled.

James H. Allport has been made a member of the license board of the Fuel Administration. He succeeds Noah H. Swayne, 2d, resigned.

C. C. Anderson, of Boise, Idaho, has been appointed fuel administrator for his state. He succeeds Frank R. Gooding, who has resigned to enter the race for the United States senatorship.

Mechanical labor-saving devices relating to mining are to be studied intensively by a committee consisting of S. A. Taylor, of the Fuel Administration, and George J. Salmon, of the Bureau of Mines, and Grant Hamilton, of the Department of Labor.



How the High Lights in the Coal Situation Strike the Cartoonist

THE LABOR SITUATION

EDITED BY R. DAWSON HALL

General Labor Review

Up to the present no revision has been made in the mine labor scales of the anthracite region, but it is likely that action will be taken soon. It must be remembered that coal mining is a permanent industry whereas the munitions industries, using that expression in its broad sense, are in part temporary. Is the large price paid to the munitions workers for war service to be duplicated in the mining fields for an indefinite period? It would seem that if we are going to let a permanent industry enrich itself by such wages the increase should be distinctly of the nature of a bonus and not a permanent increase.

All excessively high wages can be maintained only by an unfair restraint of trade and can only be kept of value by preventing, after the war, a flood of labor from other industries; for a high wage and no chance to work is clearly of no value to anyone. Clearly any attempt to keep others out of any industry is unfair and undesirable. It is going back to the old order of things, the medieval order. Certain people will be "free," as in ancient time, to enter the "mistery" of mining because their fathers or their wives' fathers were in the business. Or else the "freedom" will be for sale and we will have the miner occupying the position of the "liverymen" of a feudal city. All who pay certain large dues to the union will be permitted to enter it, and all who refuse will have to keep clear of the mines This is the inevitable result of keeping the wage rate higher in one industry than in another, as has been amply proved in the window-glass industry.

MAY READILY RE-ESTABLISH LABOR AUTOCRACIES

Freemen or liverymen, or whatever you may call them, are merely memories or functionless survivals of a dead past. They represent, however, an evil principle that can easily be reëstablished if the possibility is not watched. The public does not want the right to work in any industry restricted by anyone. Nor does it want to see wages reduced after the war, and for that reason it does not desire to see the wages in permanent industries boosted above the market value of labor.

Several men in the Gallitzin region of central Pennsylvania, all miners, have been arrested for continued drunkenness. Every miner will be glad to see that pressure is being brought to bear on these men who discredit miners as a class and the industry as a whole. Each payday these men, numbering about 20, would "go on a drunk" and remain idle for several days—idle when their country called for their services and men at the front were not getting the support needed for speedy victory at minimum cost.

ARRESTED MINERS FOR CONTINUOUS DEBAUCHES

The men seized were mostly employees of the Taylor & McCoy Coal Co. of Gallitzin and were arrested, at the suggestion of the company, by Chief of Police Lees and Railroad Officer Schlosser. The Gallitzin miners are of all countries, Americans, Russians and Austrians predominating. The report does not say anything as to the nationality of those arrested.

The Spanish influenza is stopping all meetings in Pennsylvania and consequently preventing those important sessions at which the miners are urged to speed production. The health authorities believe it is more important to output that men should be kept in health than that they should receive the patriotic stimulus these meetings afford.

There is still trouble in western Pennsylvania with the overenthuiasm of some of the officers of the draft, where doubtless it is hard to fill the quota without depleting some of the many essential industries of the district. R. W. Gardner, the manager of production for the Pittsburgh district, states that several local draft boards are exceeding their authority by placing coal miners in class 1.

He says that he is about to appeal to district draft boards to give such men deferred classification and that, if necessary, he will carry the matter to the highest authorities. He adds that there is a loss of 18 to 20 per cent. in coal production by reason of the frequency with which miners lay off work, sometimes for periods of two or three days in one week.

WANT PRESIDENT TO MAKE POINT MARION DRY

Point Marion is still a sore spot with the operators in the Monongalia field of West Virginia, in which area should be included the Scotts Run section. After payday several miners of this part of West Virginia leave the state for Point Marion, Penn., and for some time thereafter they spend their earnings in riotous living. The University of West Virginia authorities, who have large numbers of soldiers in training, are prepared to combine with the operators in demanding a closing of the saloons at Point Marion, but not because there has been any trouble with the soldiers, as these good fellows stick closely to their studies and need no legislation to keep them in due restraint.

The Point Marion liquor dealers are said to be making big money out of their traffic, as much as $10 a quart being charged for whiskey. The President has full power to take the alcoholic sting out of the Point Marion scorpion and it is to be hoped he will do it.

In the Winding Gulf district the spirit of whole-hearted Americanism is to be found at its best. A Baptist minister, the Rev. Dr. Coleman, has even entered the mines to load coal, urging upon himself that we should be "doers of the Word and not hearers only." Dr. Coleman is certainly "some doer." He loaded 12¼ tons the first night and the next night, instead of decreasing his efforts, he loaded out two tons more. He says he not only wants to supply coal for the Navy but to feel "just as his parishioners feel after a hard day's work."

TO BUILD A FIRE TO BURN DESPOTISM TO ASHES

The Right Rev. P. J. Donahue, Roman Catholic Bishop of Wheeling, has issued a summons to all the mining members of his diocese to produce coal as "true men and patriots." He says: "Your country calls you as never before. Coal is king. You are his willing subjects. Today he is the greatest power of all. I believe that, in the Providence of God, our beloved land is now the divinely appointed agent to keep the torch of Liberty flaming brightly amid the terror and the horror and the blackness spread like a pall over the face of the earth. We, the heirs of freedom, are freedom's last hope."

He then urges them that "every additional ton will build a fire to burn despotism to ashes. Every car you load helps to hasten the death knell of Kaiserism." The Bishop calls on foreign miners to eliminate the celebration of holidays and requests the clergy to actively use their influence to increase the coal output.

Illinois is deeply interested in the Fourth Liberty Bond campaign. The union has voted to buy $500,000 worth of bonds, where it will be done not being as yet decided. The miners having done this collectively, are determined to do as well individually. A subscription of $100 per member is the goal set by the union leaders of that state, and Patrick F. Murphy, chairman of the committee on coal and labor organizations in Sangamon County, announces that several unions have already made their quota on that basis within

the area over which he has worked. In the Third Liberty Loan campaign, 100 per cent. subscription was sought, but most of the subscribers took a $50 bond.

The miners at Duquoin, Ill., have promised that they will not strike so long as the war lasts, making the vow with raised hands at a mass meeting, at which C. M. Coleman, a sapper of the Canadian Army, who had served 26 months on the western front, spoke. He told them that every 80 lb. of coal was equivalent to a 16-in. shell.

The meeting was held at the close of the session of the Southern Illinois Mine Superintendents' Association, Dr. H. C. Honnold, of Chicago, the head of the Illinois division of the United States Fuel Administration, being present.

Now that the Government has taken over the Moffatt road in Colorado, the miners of the Routt County coal fields are flocking back, because they feel assured that there will be work through the winter, and all the mines will be operated to capacity. There seemed to be a question whether under private management the road would be kept open during the severe winter months.

The troubles in Canada seem drawing to an end, though in British Columbia the outcome has been a subversal of authority under which the miners' fiat becomes law. A commission should have determined what course should have been adopted in the operation of the mines.

The Department of Labor is trying to round up all the former members of the coal industry who have drifted to less important occupations. They will ask them for the country's sake to get back into the harness. A circular letter has been sent to all the 3500 locals of the United Mine Workers by Director General Densmore. The campaign is being handled by the Mining Division of the United States Employment Service, consisting of James Lord, the president of the Mining Department of the Federation of Labor; E. B. Chase, general manager of the Berwind-White Coal Mining Co., of Philadelphia, Penn.; and William Diamond, former statistician of the United Mine Workers.

The Spirit That Will Win the War

Everywhere there has been a shortage of men to handle the coke at beehive ovens. It has been necessary at the mines of the United States Coal and Coke Co. in Gary, W. Va., to bank several ovens for this reason alone. In Connellsville, Penn., the matter has been almost equally difficult to solve. Imitating the French declaration at Verdun, *"On ne passe,"* They shall not pass, the Connellsville coke operators have proposed the slogan, "They shall not bank," in reference to the iron and steel furnaces which are operated on the coke that has made Connellsville famous.

In every pay envelope appears an enclosure running: *"Furnaces shall not bank* for lack of coke—then *our soldiers shall not die* for lack of guns and shells."

From Benham, Harlan County, Kentucky, we hear that the Wisconsin Steel Co. has been wrestling with this trouble. It was solved by the simple expedient of requesting all employees to load coke on one Saturday night, Sept. 21. The solution was practical and successful by reason of the admirably patriotic sentiment of the men employed. The photograph shows how many responded. There is no indifference evidently in the little town of Benham.

The village has more than 400 coke ovens and the product they make is essential to the operations of the Wisconsin Steel Co., at Chicago, Ill. Owing to the number of men who have entered the service, it is hard to get the full coke tonnage, without employing men who are engaged normally at other work. The men who volunteered on that memorable Saturday were, during the day, miners, machine men, motormen, couplers, trackmen, pumpmen, machinists, carpenters, officemen, engineers and foremen. The list of occupations as given should be extended if accuracy is sought, for every employee who could handle a fork was crowding the coke piles and working like a man possessed.

Entering into the spirit of military service, the men before going to the ovens formed in parade and were led by the Benham white and colored brass bands. They marched to the coke yard 200 strong and loaded more than 1000 tons of coke. The ladies of Benham and the Benham Boy Scouts, Troop No. 1—for it was a community effort and the women and boys formed an important part—provided sandwiches and coffee.

"This is," says F. B. Dunbar, the proud superintendent, "the same patriotic crowd who subscribed $700 in the first Red Cross drive, $2500 in the second Red Cross drive and purchased $38,000 of Liberty Bonds. They also have organized a war chest and each employee pays from 5c. to 10c. per day into the war fund, which is to be equally divided between the Red Cross and the Red Triangle. Each family in this town receives monthly the Red Cross magazine and also the *Association Men*, which is published by the Y. M. C. A. We have a service flag with more than 100 stars. This is the spirit that will win the war. We are proud of Benham."

THE FURNACES AT CHICAGO NEEDED COKE, THESE MEN FROM THE BENHAM COAL MINES WENT OUT ON SATUR[illegible]AY

Secretary Wilson on a Wage Increase

Early in September when the question of increasing wages for the anthracite mine workers was agitated Fuel Administrator H. A. Garfield wrote to Frank J. Hayes, president of the United Mine Workers of America, as follows:

"While I find it impossible to go to the President with a request that wages be raised contrary to the spirit and understanding of the promise made to him last October, I have not hesitated from the beginning to say that I shall give careful heed to the investigation now under way by the Department of Labor of the cost of living and of the relative wages paid in all fields of industry. The principle of equalization of wages between mine workers and the workers in other fields to which you call attention is sound. It is also reasonable and right that account should be taken by me of the findings of the Labor Department Committee."

Secretary W. B. Wilson wrote to Dr. Garfield as follows:

"At the conference last night with the representatives of the anthracite miners and yourself, I made the following statement and suggestion:

"'A lifetime in the labor movement, keen observation of its ups and downs, has led me to the conclusion that the greatest asset that the labor movement has—the one thing that has gradually brought it to be a power in our country and in other countries of the world—has been its recognition of the obligation of its contracts. Whenever a contract is made for a given period of time, whether that contract be good or bad, the labor movement is strengthened if its members religiously live up to its terms. I know of no other one thing that has done as much to make the United Mine Workers of America the power in the mine industry that it is today as the fact that it has stood by its contracts.

"'Once those contracts have been made they have been lived up to, and that has been done sometimes when it meant serious discomfort to do so, especially at times when the very fact that the union was living up to its contracts was used as a weapon to defeat certain portions of its membership. In face of that kind of record and the benefits that have accrued from it I feel with Dr. Garfield that you should religiously live up to the agreement and promises entered into even if the only basis for this course was the material benefits that would come from so doing. But a higher, greater, better benefit, the spiritual benefit, comes from a knowledge of a duty properly performed.

"'Now although this is true and you have made a contract and made promises in connection with the contract there still remains the significant fact that there is seemingly a sufficient discrepancy between the wages that are paid to you and the wages that are paid to those engaged in munition manufacturers and in bituminous mining to induce a movement from your mines to these other industries such as will be injurious to the country in view of the difficulties it is now giving. That is a condition that the whole country is interested in correcting.

"'In correcting it, however, we ought to have a care not to create a condition that would reverse the process and create an undue drift from other industries into yours.

"'At the desire of the President and to secure more stable conditions in industry we have built up within a week or so a board, the title of which has not yet been decided upon. I presume it will be looked upon and considered possibly as a general wage board. It is a board that is to be composed of two representatives from each of the wage adjustment boards that have been created by the Federal Government. The purpose of that board is to review the contracts or proposed wage adjustments that may be arrived at by any one of the adjustment boards so that when they are finally announced they will not be of such a character that they will disturb the labor conditions under the jurisdiction of the other boards.

"'With that situation existing I want to make this suggestion to Dr. Garfield, that he immediately call a conference of the representatives of both sides in the anthracite mining industry with the representatives of the Fuel Administration; that with the facts already available and those that may be available before the conference takes place or is closed, the conference endeavor to arrive at a wage rate that will be just and fair, compared with that paid other industries, and will not result in workers drifting into your industry from other industries or out of your industries into other industries; and that when you have arrived at what seems to you to be a proper wage rate it be submitted to this general wage board for its consideration before being approved by Dr. Garfield so that it will know and you will know that your wage scale is not out of line with the general wage conditions of the country." In accord with this plan a meeting of the Conciliation Board with some union men was held Oct. 3, representatives of the Fuel Board being present.

NIGHT AND LOADED IT. THEIR BAND WENT WITH THEM, THE LADIES AND BOY SCOUTS SERVING REFRESHMENTS

EDITORIALS

Let Us Have "Business as Usual"

A BANNED expression is "Business as Usual," but it will serve well in the campaign against influenza. We must not let this disease interfere with our production and reduce the earning power of our men. Production is attained in part by hard work, but, at least equally, by hard-headed foresight. Many a man with eye too fast set on the main effort overlooks the possibility of attacks on his flank which will overthrow all his direct efforts.

Such flank attacks on production have already been made by ignorance of the important part coal plays in the war, by the failure of supplies, and by the delays in repairs; but influenza seems to menace a weak point at which we may, if we do not watch, suffer an even more considerable setback. Let us watch and ward against it and cause everybody to know the danger of this attack and so be ready to make the sacrifices which combating it successfully will inevitably require. Let us convince everyone that the victims of the disease cannot disregard it with impunity. Such disregard will jeopardize the lives of neighbors and fellow workers and will seriously threaten the life of the person who thus strives to regard the disease as unimportant and negligible.

The mine doctor must be energetically supported by the efforts and money of the operator. The coal industry has repeatedly urged that it could not protect its men and secure their welfare because there was no profit in mining coal and no funds were available for any but the most obvious and unquestionable essentials. If now that the industry is conducted at a profit we fail to spend the money necessary to keep disease away from our mine villages or to isolate what disease finds lodgment there, we shall not only fail to make the money which would otherwise come to our hand, but also prove untrue our reiterated contention that a happy mining camp is one where the owner is making a provident return on his investment.

Now is the time for the operator to show his leadership and his great powers for good. There are leaders a-plenty in every mine village, but too often the man in control of the plant is not the leader of the men employed in it. He should recognize the opportunity which his position gives him and assume the leadership that should be his.

Congress has clearly visualized the importance of the menace from influenza. It has voted $1,000,000 to the United States Public Health Service that it may have funds adequate to combat the disease. Every mine owner, superintendent, mine foreman, engineer and mine worker should be studying this epidemic and learning all he can about it and how to prevent it from spreading. Those whose business it is to attend to the sanitation of villages should immediately obtain all the information they can from local or state health authorities or the United States Public Health Service.

It is a national duty to keep well, for to keep well is to maintain production and to sustain our national cheerfulness and poise. Only by health can we keep our home fires burning brightly. Health has more to do with morale than has almost anything else, therefore let us keep in health that our business of war waging may continue "as usual."

"We've Started Something"

THE townspeople were assembled at the city hall to say farewell to a draft levy. John and Susie, brother and sister, aged 8 and 6 respectively, had come hand in hand to see their uncle Joe march away. Susie's eye became fixed on the W. S. S. sign on the city hall lawn.

"John," she queried, "What do those letters W. S. S. mean on that sign over there?"

This was several months ago, and John had not the slightest idea of what the letters meant. It would never do, however, to be "stumped" by a girl, particularly by his younger sister.

"Why, Susie," he replied promptly, "I thought everybody knowed that! That's easy! W. S. S. means 'We've started something.' "

This country has indeed "started something"—Cantigny, Chateau Thierry and the St. Mihiel salient form a good beginning. The Hun is commencing now to realize the strength and mettle and purpose of the enemy he so vehemently scorned and derided a few short months ago.

It is, however, far too early yet to boast of victory or flatter ourselves over the successes already achieved. The German war machine is still unbroken; the will to dominate the world and the destinies of mankind is still virulent; hell-bred, beer-soaked *Kultur* is still rampant. Those who have lived and flourished by the sword have not yet perished by the sword. The fires of hate and greed still burn furiously. The principles in the defense of which this country entered the conflict have not yet been fully vindicated.

The United States is calling upon its people to lend of their substance in the nation's defence. To us here at home the war is something vague and remote. We have not ourselves seen with our own eyes the work of *Kultur*. Had we been able to do so the entire amount of the Fourth Liberty Loan, vast though the figure is, would have been oversubscribed within 24 hours.

If we citizens of America—proud to be men among men—saw our aged fathers and grayhaired mothers crucified upon the doors or fences of what had been their homes, or dragged away to industrial slavery in a foreign land; if we saw the hands of our sons severed from their wrists in order that they might never be able to defend themselves against a merciless and unprincipled oppressor; if we saw our innocent little ones carried about our streets impaled upon German bayonets;

if we saw our wives and daughters dragged off to a slavery worse than death, to at best be the playthings and toys of German officers, or carried into the front line trenches and there tortured by means and methods unspeakable in order that their shrieks of agony might lure the opponents of *Kultur* into effective range of machine-gun fire—if we could see these things would we hesitate to subscribe to the Fourth Liberty Loan?

All of this and infinitely more is a stern reality in Belgium and northern France—and only the accident of geographical location and our ability to oppose might with might protects our own land. Our two million men, more or less, now "over there" have given and are giving an excellent account of themselves. They will soon be followed by millions more. But all of this vast man power will be useless unless these boys are supplied with tanks, guns, shells, rifles, cartridges, automobiles, horses, airplanes, etc., without stint. Money quite as truly as men is what wins wars.

"We've started something," and we can and must and will see it finished. A certain family group of seven men in Germany must learn a definite lesson in English. That lesson is the meaning of the historic American phrase "unconditional surrender."

Buying bonds will help them learn it quicker.

Want Pay for What Others Endured

NOTHING has been done thus far to change the wage of mine workers in the anthracite region, but it seems almost inevitable that some change will take place. The large wages given to munitions workers and shipbuilders are causing the mining industry to lose its men and lose some of the loyalty of those who stay on the job. It must be remembered that the big wage paid to these munition and ships men is to compensate them for the discomfort, real and imaginary, and for the expense actually incident to changing one's occupation and place of living. The cost of living and residence also is high where these wages are paid.

The miner who has stayed at home has saved much by remaining steadily at work, by not paying his good money away for moving expenses, by remaining as a skilled hand instead of entering another business at which he would be a common laborer, by paying reasonable rent, and in many other ways. To leave home or to move one's family is not worth while unless large earnings accrue. No one knows how long munitions will continue to be made, but just as soon as they are no longer needed the volunteers for work in munitions industries will be disbanded, and the savings, if any, will be frittered away in returning to the home town or in seeking for work where men have become far more plentiful than jobs.

The munitions wage is a dynamic wage; it is intended to move men. The mining wage is a static wage, intended to hold them. Unfortunately, the dynamic wages have had such kinetic energy that they have taken men from both essential and nonessential industries.

The increase in the bituminous coal regions made at the close of the year was granted in the main because work was so irregular that it was hard to keep starvation from the door. Now, that work is steady and it is hard to keep the men at work, the reason for much of that increase is not apparent. But as a permanent revision was made to accommodate a temporary condition, the bituminous miners are still receiving compensation for a hardship which they no longer endure. And now the anthracite miners, viewing the larger pay in bituminous mines, demand that they receive compensation for a hardship that they never endured recently or at any time within a decade and a half.

Thus the anthracite miners want pay for moving expenses though they have never moved, for the temporary character of their work though their work is permanent, for change in occupation though their occupation has not changed, and for slackness of work though they have had full-time operation. They desire pay for the sacrifices that others have made, to repay expenditures that they themselves have not disbursed. After all, what is more natural? How many of us are there who, when we passed the queue of men drawing their semimonthly pay at a neighbor's mine, have not wished that we might range ourselves with the rest and get pay for services we never performed.

When John No Longer Defers to You

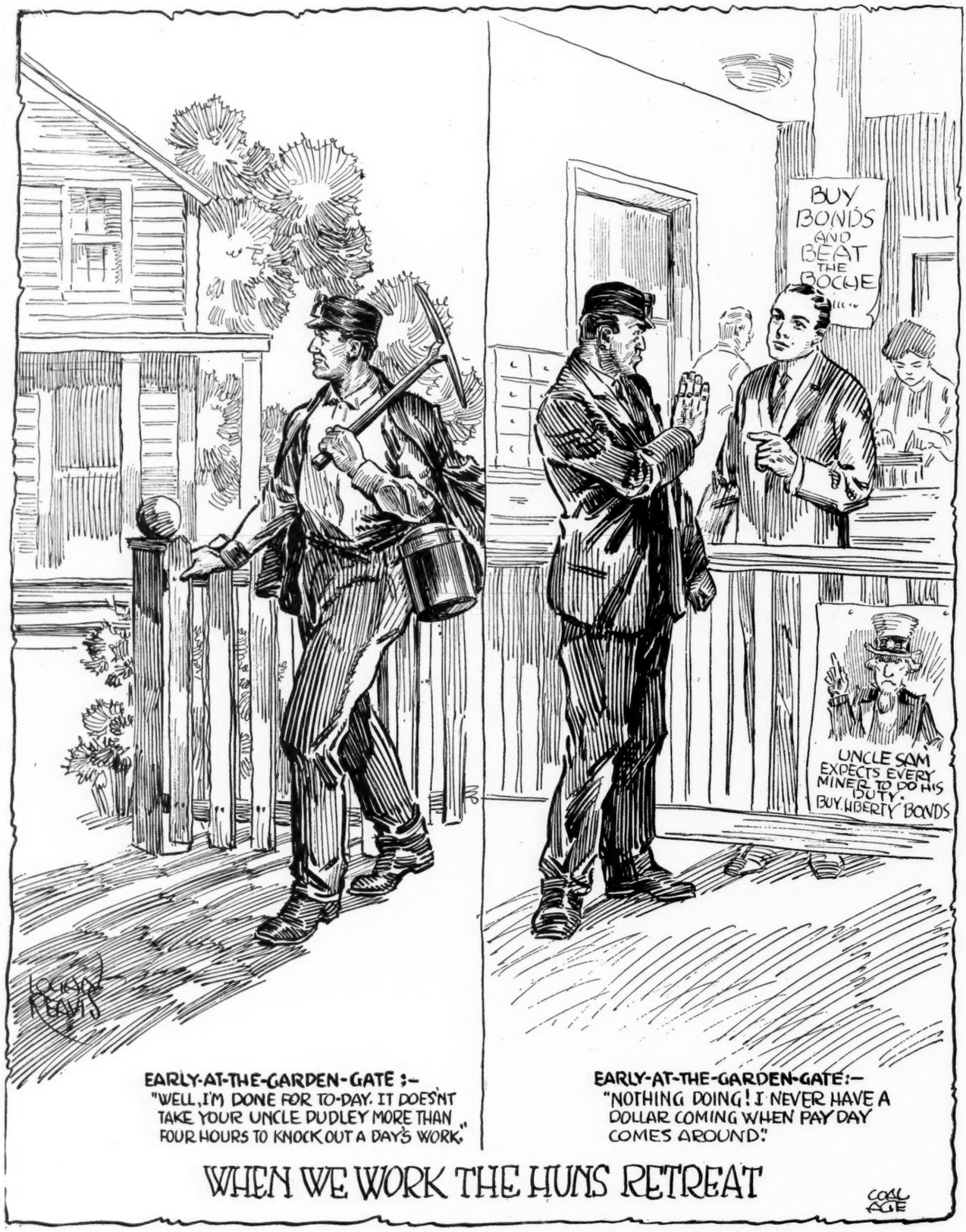
SOME have said that after the war the workman will come into his own. It is hard to say what is meant by this mysterious utterance, but shallow thinkers regard it as being of the highest importance. Certain it is that the working man always had a vote which was as potent as that of his employer. In any industry the workmen could always outvote the owners. No one has suggested yet that each employee should have two votes and the employer one. So, clearly, there is not going to be any great change in the political make-up of the United States.

But it is quite likely that the workingman will no longer defer to the judgment of his employer as freely as he has in the past. Already the worker has largely ousted the employer from the leadership which the employer formerly held without much question. The workman has leaders who come from outside and pay scanty deference to the men who own the plant and those who are paid to run it. These leaders, however wrong they may be (and they are not always wrong), however dishonorable they may be (and they are not always dishonorable), are always shrewd men. They have taken the leadership and in many cases have the worker's ears and his eyes.

The only way to meet the difficulty is the democratic way. The humblest worker in the mines, whether native or foreign, has a good keen intellect; and he will respond to the wiser head in the contest of wits. He is determined to know why he should vote a certain way and conduct himself in a certain manner. Let us have our reasons ready.

But let us studiously avoid a campaign of vituperation. The labor leaders are quite generally good clean fellows. A good clean warfare will tend to make them better and cleaner and straighten those who tend toward a less honorable course. For the operator to abuse and misrepresent them will be for him to accept those courses of action which he has most bitterly condemned. But if he places the truth fairly and squarely, before his men, and does it with good judgment, a degree of zeal and steady persistence, his work will tell and he will have nothing to fear.

"Early-at-the-Garden-Gate" Couldn't Buy His Share of Liberty Bonds


BUY BONDS AND BEAT THE BOCHE
UNCLE SAM EXPECTS EVERY MINER TO DO HIS DUTY. BUY LIBERTY BONDS
EARLY-AT-THE-GARDEN-GATE :- "WELL, I'M DONE FOR TO-DAY. IT DOESN'T TAKE YOUR UNCLE DUDLEY MORE THAN FOUR HOURS TO KNOCK OUT A DAY'S WORK."
EARLY-AT-THE-GARDEN-GATE:- "NOTHING DOING! I NEVER HAVE A DOLLAR COMING WHEN PAY DAY COMES AROUND."
WHEN WE WORK THE HUNS RETREAT
COAL AGE

Who slacks at his work will be slack in buying Liberty Bonds

DISCUSSION BY READERS

The Miner and Safety

Letter No. 1—In anticipation of the recent meeting of the National Safety Council, at St. Louis, *Coal Age* invited its readers (Aug. 15, p. 324) to offer any suggestions or contributions relating to the safety of coal miners. It was urged that the readers of *Coal Age* "cover the whole field of mining safety and mining welfare." It was stated that one's duty to the industry and to the Nation should lead him to communicate to others whatever ideas he may have worked out in his brain, with a view to increasing the efficiency and safety of mining work.

In the issue of *Coal Age*, Sept. 12, which was devoted wholly to the safety and welfare of miners, L. R. Thomas, section foreman, Woodward mine, at Edwardsville, Penn., page 518, has drawn attention to the fact that it is the experienced miner who is the most frequent victim of serious accident, because of his foolhardy disregard of the precautions that he knows should be taken to insure safety.

Mr. Thomas has expressed my sentiments exactly. It is the practical miner, who knows it all and does not need the instructions of his boss, who disregards the simplest precautions for safety and, as a result, is injured or killed. The instance given by Mr. Thomas is a pointed illustration of that fact.

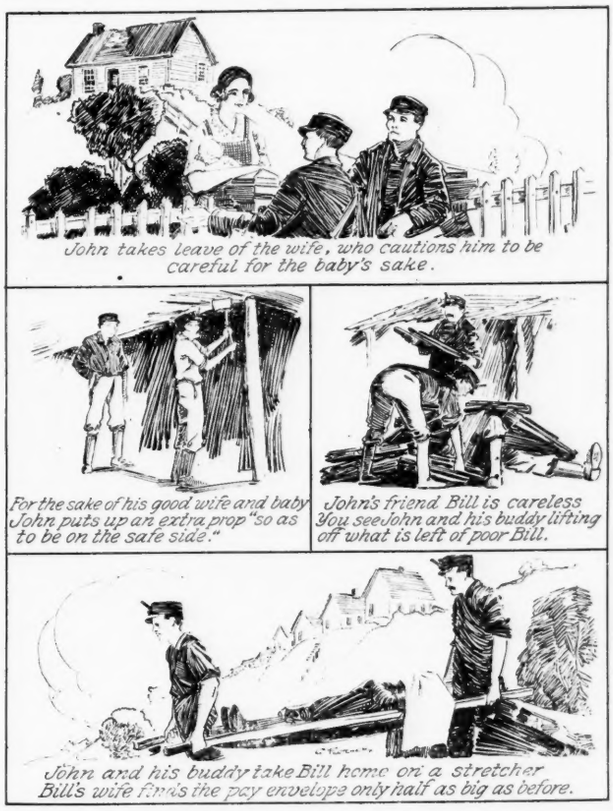
It is common to speak of the large number of foreigners who come to our mines seeking employment, as "greenhorns." But it is the "greenhorn" who listens to the instructions of his boss and obeys them. For this reason, he is safer, today, when working in the mine than many experienced miners, although there are many of the latter class among the foreigners, men who have been in this country a number of years.

In answer to the instructions of the foreman to do some posting or pull down a loose piece of slate or set sprags under his coal, the old miner answers, "Me verstay; me see; me know." The foreman passes on to the next place and this experienced miner continues his work, paying no heed to the instructions given him. It is not strange that his disregard of necessary precautions eventually costs him his life. But, that is the way of all miners, whatever their employment, from a greaser up. Their reply to the instructions of the foreman is always "Me verstay; me see; me know."

In the interest of safety, I have served as a moving-picture actor for the Coal Industries Films Co., which has caused me to take particular notice of some of the cartoons recently published in *Coal Age*. Kindly allow me to present the following sketches, illustrating the pleading necessity for a miner, regardless of his previous experience, to take the instructions of his boss kindly and obey them.

The first sketch shown illustrates a miner leaving his home in the morning and halting for a few moments to listen to the pleadings of his wife to be careful about his work in the mine that day. The wife reminds him that the little one she holds in her arms will be looking and calling for him at night. The father kisses the child and promises to obey all instructions. What is the result?

In the second sketch the same miner is observed standing a post under a loose piece of slate overhanging the face of the coal in his room. His laborer stands back and watches him. By thus posting his room he not only fulfills the "Safety First" promise given his wife in the morning, but avoids the accident that befell his less careful neighbors who worked in the adjoining room.


John takes leave of the wife, who cautions him to be careful for the baby's sake.
For the sake of his good wife and baby John puts up an extra prop "so as to be on the safe side."
John's friend Bill is careless You see John and his buddy lifting off what is left of poor Bill.
John and his buddy take Bill home on a stretcher Bill's wife finds the pay envelope only half as big as before.

These men, as indicated in the third sketch, took a chance, neglected to set the needed post and started to load their coal without examining and testing the roof above them. The result is that one was caught in the fall that took place a short time later. The unfortunate miner is shown in this sketch partly covered by the fallen slate.

In the fourth and last sketch is shown the return of these two miners to their homes, the one assisting to carry the stretcher on which his neighbor, the dead miner, is carried back to his sorrowing wife and children. The contrast is strong. These miners were neighbors, at home and in the mine. Both were experienced miners; but, while the one obeyed the instructions given him, the other relied on his experience as a miner. The sketches tell the whole story.

Permit me to suggest, in closing, that the cartoons relating to coal mining can be made more natural. They will then impress the miner more with the truth they are intended to convey. M. H. G.

Leckrone, Penn.

Value of the Mining Engineer

Letter No. 1—A short time ago there appeared in *Coal Age* (May 4, p. 823) an article bearing on the value of the services of a mining engineer, to the coal operator. If I remember rightly, that article was written by an inspector, who emphasized the absolute need of a comprehensive and accurate mine map based on surveys regularly made each year. Allow me to comment briefly on this matter, to show how some of the supposed difficulties in the employment of an engineer can be overcome.

Many small operators, in the past, have disputed the necessity of employing a mining engineer to enable them to operate their mines successfully. Their claim was, first, it would be expensive; second, the mines were too small to require the services of an engineer.

These fallacies are being gradually dispelled, and the technical man or engineer, today, is in demand, by all companies small and large. It is true, however, that a small operator is not able to employ an engineer constantly and several plans have been suggested to overcome that difficulty.

In some instances, the engineer's time is contracted for at stated intervals when he is required to make the necessary surveys and construct a map showing the various features of the mine, the property owned or leased and the surface improvements. While this plan has worked well in a few instances, it has been found inadequate at times.

Another plan, not so generally followed, is for the operators in a certain district to hire an engineer to serve them entirely, the engineer being required to devote prescribed portions of his time to each company. It is agreed, however, that all the companies have the privilege of consultation, at any time desired.

Advantages of a Coöperative Arrangement

While this latter arrangement has its advantages, some have criticised it by saying that the engineer would have his favorites and be partial to some of the companies, to the detriment of others. Such a claim would seem to be frivolous and hardly worthy of consideration, reflecting as it does on the integrity of the engineer. There are, no doubt, men who gain admission to all professions, which they serve to degrade by such dishonest, unprofessional and partial practice.

Speaking from my own experience, after working under both of these plans, the latter appeals to me as being far superior to the former. By its adoption, the operators in a district get together and employ an engineer who promises to give his entire time to their interests, while they agree among themselves as to what portion of the engineer's time each will require for the execution of their surveys and maps. The balance of the time the engineer spends in visiting the various properties, inspecting the workings and giving such advice and assistance as may be required to solve their local problems. In the performance of this work, the engineer keeps in touch with the conditions in each mine, and the problems, in each case, are constantly before him.

In contrast with this plan, that first mentioned has the disadvantage that one operator alone contracts with the engineer for a specified amount of his time, each year. It is true he gets the man's time; yet, does he gain in the end, over the other plan in which he can consult with his man at any time, while securing a due proportion of his services, according to agreement? In the first instance, the engineer probably has outside interests that are more profitable to him and demand the most of his thought and energy; but he accepts the operator's contract to keep him employed.

One great disadvantage in the plan first mentioned is the fact that the engineer sees the mine but once in a great while. In the interim, he is apt to have forgotten many details and the peculiar conditions affecting the work. For those who cannot afford to employ an engineer on their regular staff, the first mentioned plan is certainly better than none; but in a district where such an arrangement is possible, the second plan will be far more satisfactory and give better results in the end. F. L. Serviss, Sr.

Golden, Colo.

Americanizing the Foreigner

Letter No. 5—Fresh from the big cities teeming with life and energy, grimy with coal soot but vibrating with the giant heart-beats of a great nation, I came three months ago into this peaceful valley among the great hills. What a contrast from the region I had left behind, far from the coal fields! But I came here with the thought that I might work to better advantage in helping to win the war.

Until last winter, when all the great manufactories of the country were shut down for lack of fuel, the coal industry had been a closed book to me. Since coming into the coal fields, however, my associations have brought me into closest contact with this great arm of American industry. It occurs to me that, as a stranger, unhampered by prejudice or habits, it may be that my observations may help those who are studying the labor situation in its relation to the output of coal.

Mention has already been made in *Coal Age* that, in mining camps where men own their own homes, conditions are much more satisfactory than when they are compelled to live in company houses. This appeals to me as one of the chief factors in coal production. Its truth was impressed forcibly on my mind, a short time since, when a committee of women were around soliciting Red-Cross funds. It was between paydays and, although these negroes and foreigners, many of them, had earned as high as $200 for a two weeks' pay, they had no money to give.

Although well housed, on premises that were neat and orderly, the general attitude of these peoples was both listless and shiftless. Looking at them, I could not but feel that had they had the privilege of buying little houses and lots that they could call their own, it would be a great incentive to them to work and stay in one place; there would not then be the desire to depart and seek work elsewhere.

On the other hand, in a mining camp where the coal company own the entire colony, there is no hope of the men accumulating anything. The man who came from Europe, seeking freedom, political and otherwise, braves poverty and the perils of the unknown, for the sake of his principles. Such a one soon feels the yoke of the restrictions of this mining camp and drifts away to the big cities where he seeks employment affording greater opportunities.

Only a few days ago a miner came into our commissary, and, while serving his wants, I engaged him in conversation. He was a clean-cut Hungarian. He told me he was leaving the next day for Chicago, where he could attend night school and study English, which would greatly improve his chances. He told me that the average foreigner, notwithstanding the general belief to the contrary, was a downright intelligent person. He argued that, lacking intelligence, these men would not have the courage to throw off the yoke of Europe and come to a strange country. He added that when foreigners come over here and contempt is shown them as a class, not to say individually, it arouses resentment, which is natural.

While frankly admitting that there were exceptions to the rule, my man was strong in the belief that the more intelligent of the foreign element were essential to every industry, particularly mining. When he left I reflected on the truth of his last statement. Industry everywhere needs brains; but strong backs and weak minds are not essential to any operation. My conclusion was that the more intelligent a worker is the more eager he is for advancement. The thrifty miner is not content to live in any other than his own home, be that ever so humble.

The Labor Problem of Today

The most difficult feature of the labor problem, and the hardest to solve, is the relation of the American element to the foreign element. Although living within a stone's throw of each other and in daily contact, they are quite separate. They meet in the mine or in the commissary but the foreigner is generally morose and unfriendly. Practically the only time when they display enthusiasm is on one of their holidays.

Seldom does one observe any attempt on the part of the American population to mingle or become friendly with the foreign element. Replies to my inquiry state that this has been attempted but without success. However, my own experience when approaching a foreigner with careful tact is that he is easily won. My conclusion is that, in the large majority of cases, they are not approached in the proper way but have been handled as a class. Their educational advantages have been very limited, and when the supply of labor is equal to the demand the foreigner is often neglected.

Let me urge that it is the American element, as much as the foreign element, in our mining camps, who need waking up to the necessity of putting their shoulders to the wheel, in a way that is necessary to the success of any industry, war or no war. Honest efforts must be made to teach these new citizens how to become good Americans. Much has been done along this line in the public schools; but how much could those efforts be furthered if American mothers and school children would welcome into their mothers' clubs the foreign mothers in their midst. Patience and good-will are required to make them understand our purpose, which is to bring them to appreciate American ideals and standards. After all, it is the home that breeds either satisfaction or discontent.

Social service work in these homes, I know, has been attempted in the past with varying success, but it must be continued with patience and perseverance. Although foreigners are loath to mingle with Americans in a social way, they will attend public gatherings; and if a few earnest women would get together and form mothers' clubs I feel sure much good would be accomplished. The entertainment at the schoolhouse is always successful in drawing different classes of people together, and filling the house with a social throng.

When the foreign miners see that a real spirit of coöperation exists, they will be drawn to love this country of their choice. and they and their children will be Americanized and the foundation of great things will be built. At the same time, the miner will better understand his work in the mine. As long as there are a few intelligent foreigners in any group, and there always is, these are a source of encouragement to the worker.

Let coal companies do more welfare work, establishing and maintaining night schools for the teaching of English. This is constructive work and will accomplish its purpose. It will prove a real benefit to the company, but that is incidental. The true purpose is patriotism and love of country.

J. Tague.

Holden, W. Va.

Exemption for Coal Miners

Letter No. 1—Owing to the shortage of labor, in coal mining, the suggestion has frequently been made that this class of labor should be exempt from the operation of the draft law. It is gratifying to know that a number of *Coal Age* readers who are contributing to these columns express themselves as opposed to such a plan. I was particularly pleased to read the letter of Ostel Bullock, *Coal Age*, Sept. 5, p. 462, in which he gives good reasons why there should be no class exemption for coal miners.

There is no question but that the draft law has already called many good miners from their work in the mines and sent them to the front to take part in the great struggle for democracy. The point I would emphasize here is that a ruling granting exemption to coal miners, at the present time, would be apt to cause hard feeling among the relatives and friends of those miners who have already been called to service, many of whom, we regret to say, will never return.

Now, regarding the situation from a patriotic angle, we must agree that there is no patriotism in urging a claim for the exemption of miners as a class. While it is true the mining ranks have been depleted by reason of the draft, it is likewise true that all other means to produce the required tonnage of coal should be exhausted before attempting to discriminate in favor of the mining classes. As Americans, we stand as a unit as soldiers and workers in every craft producing the necessities of war.

Observation makes clear that there are many able-bodied men working in nonessential trades and indus-

tries. These should be forced into other occupations that are necessary for the prosecution of the war. It is true that they would make poor miners at first, being inexperienced in that line. Like the soldier, they would have to be trained, but this would not be as difficult a task as may be supposed. Many men having no more experience than these have gone into the mine and succeeded.

In my opinion, it will be necessary after the war to train new men for mining work, and we might as well begin to do that now. Let me urge, then, that we do not favor the exemption of coal miners because they are miners, but let us all stand shoulder to shoulder and be loyal to the call of our country.

Perryopolis, Penn. R. W. LIGHTBURN.

Hindrances to Coal Production

Letter No. 3—Among the many hindrances to the production of coal that have been suggested in the letters written on this subject, perhaps few are of greater influence than favoritism in the management of a mine. Instances in my own observation impressed me with the thought that this is a great factor in the discouragement of ambitious mine workers, whose zeal in the work is greatly lessened thereby.

As years come and years go, the men of the mine have their memories that rush over them, perhaps, even to a greater extent than is true of workers in other industries. In some ways it is amusing, but, in others very discouraging, especially for the young man who has progressive ideas and hopes for his own future advancement.

Here, for example, is a young man progressive, thoughtful and ambitious. An idea comes to him that he submits to his foreman as a suggestion for bettering the conditions in his particular branch of the work. The suggestion may not appeal to the foreman, who, in a condescending way, replies, "I will see to it," and that is the last the young man hears on the subject.

Is it not surprising there is no incentive to sincere coöperation when an honest effort of a thoughtful man meets with such a reception on the part of his boss? Today we are all striving to reach the goal of success, and it requires concentration of thought and the coöperation of all workers.

A FOREMAN'S FAVORITES SURE TO FOLLOW HIM

Only recently, an instance occurred that showed clearly the ill-results of favoritism on the part of a foreman who was transferred from one shaft to another, in the working out of the plans of the company. The foreman previously in charge, in that mine, was a man of few words but full of pep. He was accustomed to allow his assistants many privileges, while he watched their every move and gave an attentive ear to any suggestion that meant another car of coal on the shaft bottom. Following a good day's run, he would meet his men at the bottom of the shaft, complimenting those whose efforts deserved recognition and cautioning others who needed to speed up. There were delays that were unavoidable in this, as in other mines, but these he passed slightly over.

It was not many days after the change of foreman that new faces began to appear on the shaft bottom. They were men whom the new foreman had been accustomed to treat with special favor in the other mine. A little later, almost everyone who was a favorite in the other mine had found a place here and was working under his old foreman from whom he received the same privileges as before. The result can easily be imagined as to the effect on the mine workers of longer standing, some of whom were displaced to make room for the newcomers and all of whom missed the friendly and helpful words of their old foreman.

There are foremen who are desirous of showing their authority on all occasions, but the time is fast passing when such men can successfully manage a mine. Such a foreman must now step down from his high perch and listen when a complaint is made that he can adjust with satisfaction to all and without discharging a man who is probably the innocent victim of prejudice or the jealousy of a fellow worker. The following incident will show how the failure to make such an adjustment cost one foreman the loss of a good worker:

Having recently studied on a plan to increase the output in my district, I put it up to the men with the result that one man and his laborer turned out 144 cars of coal in a month, and several others did nearly as well. It happened, however, that the man just mentioned had a little trouble that hardly amounted to anything. The foreman listened to his complaint but refused to adjust the matter, turning the man down flat. Knowing that he could secure work anywhere, the man loaded his tools and quit.

PRACTICAL RESULTS OF "PLAYING FAVORITES"

Now, compare the result. The foreman at once gave the place to a favorite, who, in 27 days, loaded only 90 cars of coal, a decrease of 37½ per cent. in the output of that one place. This instance is only one of many that are occurring daily in our mines and which are the direct results of favoritism on the part of many mine foremen.

A few days later, the miner who had quit his place came around for his pay. The superintendent met him and asked him to come back, telling him everything would be all right. On the strength of this, the next morning found him at the mine ready to go to work. The foreman, knowing that he could not set aside the authority of the superintendent, took the man into the mine and showed him one of the worst working places there. He knew well that the miner would quit before he would work the place, which would give him, the foreman, an opportunity to override the authority of the superintendent.

It can readily be imagined that the superintendent knew that the foreman was playing favorites. It was a matter, however, that he did not feel warranted in going further to adjust, which would mean taking the matter up with the management and result in a possible cause of friction between himself and the foreman, whose right to authority in the mine is generally recognized.

Let me urge, then, that it is time for mine foremen to set aside the old method of handling men and cease to play favorites. Let us be progressive and coöperate with our men, who will give better work in the knowledge that they can get a square deal in return.

Plymouth, Penn. JOSEPH R. THOMAS.

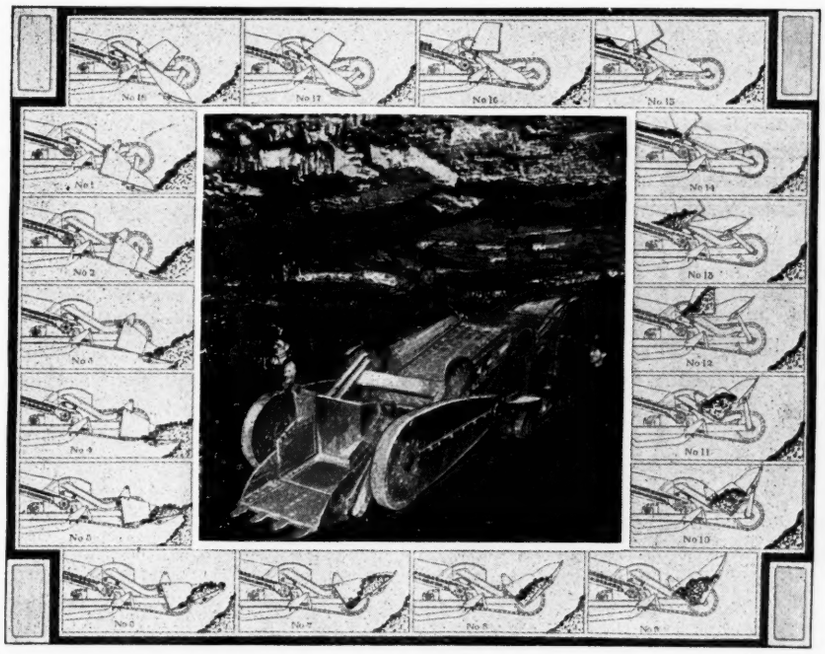
INQUIRIES OF GENERAL INTEREST

Face Coal Shoveler and Loader

Kindly permit me to refer to the inquiry relating to "Improved Coal Equipment," *Coal Age*, Sept. 5, p. 465. In answer to the question asking for the most up-to-date coal-loading machine, the Jeffrey machine is mentioned as being the only one designed for loading coal at the face. While it is true that the Jeffrey loader is a light and portable machine that has given good satisfaction where it has been installed, allow me to ask if mention should not have been made of other devices and machines used for this purpose. INQUIRER.

———, Penn.

Passing over, for the moment, the numerous types of conveyors and scrapers employed for this purpose, it is true that the shoveler and loader designed and manufactured by the Myers-Whaley Co. should receive attention. This machine has been largely known as a "shoveling machine" and has been used in quarries and underground work where loose material of any kind needs to be shoveled up and loaded into cars. The Myers-Whaley machine differs from other loaders in the fact that no hand shoveling is required. In the case of conveyors and other types of loaders, the material must be shoveled into the machine to enable it to be loaded into the cars, while this loader is equipped with an automatic mechanical shovel, so constructed that it is able to scoop up material of any size that will enter the shovel and load it into the car.



The machine operates equally well on rough or smooth pavement, and there is less breakage resulting in the shoveling of coal than when the work is performed by hand. Not only can the machine be used to shovel material from the floor but it will spade into a heap of material, at any point above the floor. Also, the material can be discharged immediately behind the machine, in line with the shoveling, or on either side of the track, as desired. Incidentally, it may be mentioned that the conveyor that elevates the material and transports it to the car serves also as a picking table, for the separation of any slate or rock that might be mixed with the coal. The accompanying figure shows the Myers-Whaley shoveler and loader at the face where the coal has been shot down and is being loaded into a mine car.

In view of the severe conditions under which this shoveler and loader must operate, great care has been taken in its design and construction. The best obtainable material is employed and every movement and detail simplified. The machine is built for strength, durability, economy, and efficiency. All castings are of steel and forgings have been used wherever possible. The conveyor is so designed that the surface subject to abrasion, by the material, is made of steel bars, leakage being prevented by the belt to which the bars are bolted. Lubrication of all principal parts is effected through pressed-steel compression grease cups mounted on the bearings, in most of which brass and white-metal renewable linings are provided. This shoveler and loader is operated by one man. The power employed is either electricity or compressed air, depending on the conditions of equipment at the particular mine where the loader is to be installed. Like other loaders of this type, the machine runs on a track but may be equipped with traction wheels. It is self-propelling, forward or backward. A feature that should be mentioned in connection with mine work is the fact that there is no difficulty in operating the machine on straight or curved tracks.

In its construction, the machine is built in three sections, the main frame is mounted on a truck and carries the motors for its operation. Attached to the forward end is a swinging jib equipped with a specially designed shovel, which scoops up the material and, turning over, deposits it on a conveyor that acts as an apron over which the material is carried to the rear conveyor that transports and deposits it in the car.

The power consumption of the No. 4 size machine is 0.22 kw.-hr., per ton of material loaded. In continuous loading, this machine can handle from 200 to 400 tons in an 8-hour shift and can work in a 6-ft. headroom.

EXAMINATION QUESTIONS

West Virginia Examination (1918), Mine Foremen and Firebosses

(Selected Questions)

Ques.—State the law in regard to safe travelingways. Why are manholes necessary? In your opinion, why are so many men injured by falls of roof—by mine cars? What should be done to eliminate this?

Ans.—The mining law of West Virginia (Sec. 21) requires that a travelingway not less than 5 ft. high and 3 ft. wide, be maintained at the bottom of a hoisting shaft, to enable men to pass around the shaft, without going under the cage.

Sec. 31 of the law specifies that a safe and available roadway, properly drained, shall be available for the passage of men, at all times when the mine is in operation, to enable them to reach one or the other of the two outlets to the surface.

Manholes should be provided on all haulage roads where men are obliged to travel, and at the foot of all slopes or inclines to enable men to seek refuge from moving cars or trips. Injury from falls of roof are largely due to the neglect of mine workers to make their places safe by timbering, or to the insufficient timbering of roadways and travelingways. Also, to the neglect of miners to properly inspect and timber their working places before starting to load their coal into the cars.

Injuries from the movement of cars are due largely to the failure of the management to provide separate travelingways for the men to reach their working places, and requiring them to travel haulage roads where there is insufficient clearance room at the side of the track, and refuge holes are not available. Accidents of this nature are also due to the failure of drivers to sprag their cars when descending grades, or to the location of a door at the foot of a grade, or to the disobedience of mine regulations and rules by men who persist in riding loaded cars and trips passing out of the mine.

In order to reduce to a minimum the number of accidents occurring in the mine, a closer inspection of all mine roadways, travelingways and working places is necessary, and the enforcement of strict rules and regulations relating to safety; also, the maintaining of an ample supply of timber required in the mine and providing every appliance that will make the mine safer for work.

Ques.—If you were traveling in an air current of high velocity, with a safety lamp, and you suddenly came in contact with an explosive firedamp mixture that filled the lamp with flame, and you had no means of smothering it, explain how you would protect yourself from danger.

Ans.—This question assumes a condition that a careful and competent fireboss would rarely meet. It is difficult to understand how a man, traveling in an airway where the current has a high velocity, would suddenly meet with an explosive mixture that would fill his lamp with flame, except the gas was coming from a strong feeder in the entry or was issuing from a room. It must be assumed that the man in question is traveling with the air, as otherwise the gas would be diffused in the air current, and its presence would have been detected by any good fireboss on his first entering the airway.

However, if the gas encountered was coming from a strong feeder or issuing from a room, a cautious fireboss, approaching such feeder or room and observing that he had entered a strong body of gas, would at once lower his lamp and retreat against the air, taking the precaution to shield his lamp from the force of the current. To do this he might be obliged to walk backwards holding his light in front of him to protect it as much as possible from the moving air.

Ques.—In your judgment, how often should the abandoned parts of a mine be examined?

Ans.—The frequency with which the abandoned parts of a mine should be examined will depend on their extent and character, as well as upon the amount of gas generated in them. Where there is a considerable abandoned area that is subject to constant roof falls, and the place is generating gas, daily examination should be made to ascertain its condition. Such places should be thoroughly ventilated to prevent the accumulation of large bodies of gas, which would be driven out onto the entries by a sudden fall of roof. On the other hand, a limited abandoned area that is in fairly good condition and not endangered by accumulating gas would only require an occasional examination, say once a week or as often as may be necessary to keep track of its condition.

Ques.—In making the examination of abandoned places, should you find an accumulation of explosive gas therein, what method would you adopt to remove the same or make those portions of the mine safe?

Ans.—Before attempting to remove the gas, care should be taken to ascertain that there are no men working on the return of the current. If possible, the work of removing the gas should be done after the men have left the mine. No open lights must be permitted in that section of the mine. The quantity of air passing should then be increased as much as possible. Following the air current, the men employed in performing the work should proceed with caution, making frequent tests of the air as they advance. Brattices should be erected to direct the air so as to sweep away the gas. It would be well to use as few safeties as possible, depending on electric mine lamps for light. The safety lamps should be well guarded against a rush of air caused by a possible fall of roof. The fireboss should employ only experienced men to assist him in performing the work.

COAL AND COKE NEWS

Harrisburg, Penn.

It is doubtful whether the present Liberty Bond campaign will reveal anything more remarkable than the fact that in less than the first two days of the campaign every one of the more than 16,000 employees of the Lehigh Valley Coal Co. pledged a subscription. What makes the record all the more extraordinary is the fact that this great force of employees made a 100 per cent. subscription in the preceding campaign. In singling out this company's working payroll for special commendation, there is no intention to undervalue the achievements reported by other coal corporations. Special reference is made to the Lehigh Valley because of the great number of its employees and because of their diverse nationalities, many of them being subjects of a country with which we are at war.

Charles M. Means, manager of the inspection section of the Federal Fuel Administration, states that he will put a special field inspector in the western part of the State at an early date with the object of cleaning out producers who are loading "dirty" coal.

Following a luncheon of about 30 coal jobbers of the Pittsburgh district on Oct. 1, what is known as the Pittsburgh District Coal Jobbers' Association, a branch of the National Coal Jobbers' Association, was formed and a constitution and bylaws to govern the organization were adopted. Temporary officers elected to conduct the meeting were Charles S. Bygate, president and William Carothers, secretary. The objects of the organization are to benefit and protect its members in handling coal in the Pittsburgh district as jobbers, distributors and purchasing or selling agents, to facilitate coal sales and deliveries and to improve methods of conducting trade and commerce in coal, and to encourage increased production.

Uniontown, Penn.

Fuel production records for the Connellsville regions were again advanced for the week ended Sept. 28 when the output totaled 744,842 tons. That figure is 16,528 tons above the output of the previous week and is 8221 tons in excess of the region's previous high record of Sept. 14. Had not electric power given interrupted service, there would have been no loss in coke of 4137 tons, which would have sent the weekly output past 750,000 tons. Coke shipments were 333,137 tons.

While the Baltimore & Ohio R. R. still has its car shortage in rather pronounced form, the shortage during the week was reduced to 30 per cent. The Pennsylvania system, however, is maintaining its good record, reporting placements for 100 per cent., both coal and coke. Barring unforeseen developments, that record is likely to be maintained indefinitely; at least so long as good weather prevails.

All efforts next week will be centered on the region's fall fuel drive. Eight hundred thousand tons is the total, which is 75,000 tons higher than the average for the region. The plan of the production committee is to strike a pace at 800,000 tons and maintain it until next spring. Quotas will be issued to every mine, and plant representatives of the production department will apportion an equal part of the increased output to invididual miners.

Fuel Administration officials in conjunction with transportation officials are bending every energy to provide favorable conditions next week, so that the loyal workers may be unimpeded by outside influences in their patriotic efforts to put the coke regions over the top. There is no doubt in the minds of fuel officials that the record will be reached by diligent application of the workers if those conditions can be controlled.

Charleston, W. Va.

A large loss of tonnage in the Fairmont region during the month of September has been due to execrable car service. The supply for the last week of the month was no exception. It grew worse as the week drew to an end. On Friday there were only 1418 cars in the district, and of that number only 597 had been placed in time to begin loading. The day before that there were 1500 cars, but only about 1000 were placed in time to begin loading. Friday seemed to be an extremely unlucky day for the region since a shortage of electrical power made it impossible for some of the mines to operate, and in some instances mines were forced to shut down.

The Pocahontas and Tug River districts, because of speeding up and a better car supply, produced 5797 tons more the last week in September than were produced the week preceding. In all 7337 hours were put in, the result being a total net tonnage production of 438,810. The chief cause for gratification was in the reduction of the tonnage lost through labor shortage. Tonnage lost from car shortage is now almost negligible, being only 944 tons, but mine disability caused a loss of 17,893 tons. The amount of coke manufactured was not so large as the last report showed, being only 46,946, or about 3000 tons under the previous week. Two million tons production is the goal for the Pocahontas and Tug River districts during October.

Miners in the New River district wound up the last week in September by a gain of 5568 gross tons over the previous week, the total production for the week being 154,668 gross tons. Car service in this district was about 100 per cent.

The Winding Gulf district produced 119,107 gross tons during the last week in September. The operators and miners are aroused to what is needed and with Foch's drive and the Liberty Loan drive gaining momentum, the entire personnel of the industry are determined to do their part. Measured in net tons the gain of the New River and Winding Gulf districts amounts to 23,404 net tons. In the Winding Gulf as in the New River district there is the fullest co-operation between the industry and all railroad operatives. In this particular district the car service is all that could be desired.

The Kanawha district continues its steady gain. Last week in September the total production was 217,809 tons, which represents a gain of 20,000 tons over the preceding week. The car supply was all that could be desired, the number of hours lost because of insufficient cars being 322. The total time required to get out the above tonnage was 6042 hours. The loss in time due to labor defection was only 579 hours.

Birmingham, Ala.

Greatly increased production of coal in the Birmingham district is looked for in October, with estimates of the output during the month of between 400,000 and 524,000 tons weekly, based on the efforts being made by every interest involved in the industry to bring about the largest possible output.

M. J. Sanders, director of Mississippi and Warrior River transportation, has promised that the Warrior River barge line will be in operation before Oct. 15, thus affording facilities for the moving of 20,000 tons of coal, which will be floated down the river to Mobile and New Orleans every 30 days. Within two months the system will have been so enlarged that twice that amount of coal can be transported monthly, relieving the car shortage and enabling the roads to handle an additional amount of coal to points inland.

The two seaports which are the chief consumers of bunker coal from this district, Mobile and New Orleans, report that although a great amount of bunker coal has been carried to those places by the railroads, there is still room for a further supply, and indications are that shipping interests will require a great additional supply to fill their demands during the next three months, the rush season.

There is need for coal at coke ovens in the district also. Some complaint has been heard of the quality of coke lately, as well as the quantity produced. Delay in finishing one of the largest coal washers in the district hinders production to an appreciable extent, but no remedy is available, both material and labor being scarce.

Several wagon mines in the Cahaba Valley are beginning to bring in coal in quantity, two trips a day being made by some of the wagons. Two to four and five tons of coal a day are being handled by each wagon.

Victoria, B. C.

Nichol Thompson, Fuel Controller for British Columbia, and the coal mine operators of this Province have received notice from Ottawa, Ont., that regulations providing for the more uniform distribution of coal needed for industrial uses in Canada have just been approved by the Governor-in-Council at the instance of the Canadian Fuel Controller.

They provide that all mine operators in Canada and importers of industrial coal in this country shall rotate delivery of coal among their customers in proportion to their requirement, so that no one shall at any time have advance supplies on hand while others are under-supplied.

A preference list of coal consumers is also outlined in the regulations. Those preferred consumers include railways, military and government buildings, public utilities, retail dealers and manufacturing plants chiefly engaged on war contracts. These must be given preference in supply over all other users in the order named.

Drastic provision also is made against the unnecessary hoarding of coal on the part of industrial users and heavy penalties are provided. Those whose operations required large advance stocks at the end of the present coal year must obtain special permission from the fuel administrator. Provision is made whereby mine operators and importers may require certified statements from their customers as to the tonnage of coal on hand and required for each month, so that an equal distribution may be made of all coal mined and received in Canada.

PENNSYLVANIA

Bituminous

Washington—J. W. Emery has sold to the Mingon Coal Co. the coal underlying a tract of land containing 181.876 acres belonging to Mary A. Leyda, Helen K. Leyda and Ross A. Leyda.

Pittsburgh—The Pennsylvania Bituminous Mine Inspectors Advisory Association, whose membership comprises the 30 mine inspectors, held a meeting at the Seventh Avenue Hotel, Oct. 4. The purpose of the meeting was to discuss mining matters and how they could best aid the United States Fuel Administration in keeping the coal clean and to help increase the production.

Connellsville—Edward A. McCoy, of Broad Ford, has purchased a farm of 106 acres in Lower Tyrone township with a portion of the coal underlying it, from J. Fred Kurtz and W. D. McGinnis, and has started mining operations there. The farm originally belonged to William Hay and S. Wowatski, who sold it to Messrs. Kurtz and McGinnis. The transaction with Mr. McCoy involved the sum of $8000.

New Castle—More than 1800 acres of coal and limestone land in Big Beaver township, valued at approximately $175,000, is included in a purchase made by the Crescent Portland Cement Co. of Wampum. The properties include the holdings of the Beaver Coal and Coke Co., Wampum Coal Co., Mehard-Dinsmore interests and Matthew Gunton. The new owners plan to increase the production and employ many additional men. Much of the coal mined will be used by the cement company for the operation of its plant.

Indian Head—The Melcroft Coal Co. which is opening an extensive coal field in the Indian Creek Valley, has completed 100 miners' houses and announced that it will construct 300 more in the spring. The electrical plant was started last week and the coal production has materially increased. The houses are unique in that the new mining town will not have two houses alike in design and will be painted differently in so far as the color scheme will permit. The houses are all equipped with modern conveniences and running water and light.

Indiana—The coal production of Indiana County has been greatly decreased by the epidemic of Spanish influenza which is raging in several of the mining towns near here. The Coal Run mines, where there are 450 cases of the disease and seven deaths, have been shut down entirely. Several of the officials are confined to their beds. The mines at McIntyre, Luciusboro, Fulton Run and Ernest are greatly crippled on account of so many of their men being stricken. The schools and moving picture theaters have been closed and nurses and doctors have been rushed by the state and federal governments to this county. Guards have been placed at all the towns and are enforcing strict rules as to arrival and departure of all persons.

Anthracite

Pittston—Mine workers in this vicinity are taking a prominent part in helping this district meet its quota in the Fourth Liberty Loan drive. At the Pennsylvania Coal Co. and the Hillside Coal and Iron Co. the workers have made 100 per cent. subscriptions, and similar reports are expected from employees of other mines now being canvassed.

Jeddo—Miners dropped their picks on Sept. 28 and put on exhibition some extremely large cabbage, potatoes and other vegetables at their annual war garden show. The G. B. Markle Coal Co. has given land to its employees free and has plowed it every spring. Between 15,000 and 20,000 bushels of potatoes were grown and 6000 heads of cabbage, as well as hundreds of bushels of other food products. Prizes were awarded to many of the successful amateur farmers.

Punxsutawney—Spanish influenza is wreaking havoc upon the mining town of Wishaw, six miles east of here. Nine-tenths of the population of 500 miners and their families are afflicted, 450 cases of the disease having been reported up to noon Sept. 30, and within the last few days many deaths have been reported. The only two physicians combating the disease have been stricken with the malady and have been forced to quit their work. The State Health Department has supplied physicians who have placed the town under quarantine.

Wilkes-Barre—Vice President F. M. Chase, of the Lehigh Valley Coal Co., in meeting new labor conditions by the employment of 50 young women in the office building to replace the young men who have been drafted, is now taking steps to make these young women comfortable. A rest room for the female employees is being fitted up in the office building and a professional nurse has been employed as matron and advisor for the girls. This is in line with the policy of this company in looking to the comfort and contentment of its employees, the Lehigh Valley being a pioneer in the movement for attractive colliery surroundings and better working conditions.

Shenandoah—Officials of the Philadelphia & Reading Coal and Iron Co. strongly deny that the company insisted on employees making a declaration to remain in the employ of the company at least seven years in order to secure exemption. It was pointed out that the company, in view of the fact that collieries have been crippled and production lessened by the large number of mine workers entering the service, is making every effort to secure the men necessary to keep the collieries operating at top speed, but no limit is placed on the time men shall remain in the employ of the company. Officials claim, however, that they expect men exempted because of their essential occupation to remain at work at the collieries at least for the duration of the war.

WEST VIRGINIA

Hartland—Work was started this week on the construction of a plant for the development of a tract of coal at Hartland leased by E. Fellabaum, of Charleston. Within a short time the lessor expects to have his plant in operation.

Huntington—Following a recent hurry call for coal consigned to Cincinnati, Ohio, to be sold by the Cincinnati Red Cross, 35 officials of the Lundale Coal Co., from the vice-president, general superintendent and secretary down, loaded four railroad cars with fuel before noon.

Peytonia—The Peytonia Coal Co. is about ready to begin operations at its No. 2 mine at this place in the No. 2 gas seam. By Nov. 1 the company expects to have the plant completed and to begin the shipment of coal. The mine will have an actual capacity of 200 tons per day.

Clay—With power to be supplied from a central station at Hartland, the Lima Coal Co., of Lima, Ohio, is arranging to proceed with the construction of its plant near Clay, including the erection of a tipple, many new houses, etc. Construction work will be begun at an early date. E. H. McCool will be in charge of operations.

Charleston—J. B. Hart, of the Hartland Colliery Co., has acquired a tract of 5400 acres of coal land in Kanawha County, the land being underlaid with Cedar Grove, No. 2 gas and other Kanawha seams, the newly acquired tracts adjoining the holdings of the Hartland company. Arrangements will be made to develop the property at an early date.

Fairmont—Among other improvements being made by the Chesapeake Coal Co., at its plant near here, is the installation of an electric hoist. Operations at this plant are in charge of J. J. Halcomb, superintendent.

Numerous improvements are being made at the plant of the Marion Gas Coal Co., near this city, a new water system having been installed. The company has also built a large number of new houses. J. D. Vutor is the superintendent at this plant.

ALABAMA

Bessemer—George H. Stevenson and associates, who recently acquired the Bamford coal mines located about 12 miles from Bessemer, which have been idle for some time past, have inaugurated active operations for production. A quantity of new mining machinery and equipment has been installed. The coal is of good grade, the veins running from 4 ft. to 5 ft. in thickness.

KENTUCKY

The West Virginia and Kentucky Coal Co., located on Smoot Creek, Letcher County, made its first shipment of coal on Monday, Sept. 9. This company leases from the Kentucky River Coal Corporation 1200 acres of coal, mining what is known locally as the Amburgy seam, the analysis being practically the same as the famous Elkhorn seam. The coal averages 5 ft. in thickness and is an excellent by-product coal. The town, yet to be named, consists of some 60 four-room houses, and a contract has been let for 50 more. All the houses are modern and up-to-date and modern "Sanisep" closets are installed in each house. The company starts out with shipments at the rate of 750 tons daily, which will be increased until 2000 tons per day has been reached. The officials of the company are Harry P. Jones, president; T. P. Jones, general manager; H. S. McClelland, secretary; J. B. Kennerly, treasurer.

ILLINOIS

Oglesby—Plans have been made for the temporary employment of the miners from the Oglesby Coal Co.'s plant, which was closed by an injunction secured by the Marquette Cement Manufacturing Co. For a few days the coal company asked its employees not to seek employment elsewhere, as it was believed that the injunction would only be temporary. It is hoped by the Oglesby Coal Co. that the men can secure employment in and near Oglesby, so that they will be enabled to reside there permanently.

Carlinville—Mine No. 4 of the Standard Oil Co. is being concreted. Excavations have been made 11 ft. below the coal for the concrete foundation. It will take at least 30 days to complete the work. Delays have been experienced in the arrival of the machinery, and it may be the first of the year before the hoisting engines and steel tipple are up. At Mine No. 3 the hoisting shaft is now down about 165 ft., and the material shaft is down about 60 ft. Work is progressing well on the power house and the dam.

Royalton—Twenty-three men are believed to have lost their lives in an explosion Saturday morning, Sept. 28, in the north mine of the Franklin Coal and Coke Co. Six bodies have been recovered. Rescue crews found it impossible to reach the portion of the mine where the others are supposed to have been at the time of the explosion, and the mine has been sealed to extinguish the fire. Among those who perished were Superintendent A. E. Capstick, Manager Theodore Helm, Pit Boss A. A. Capstick, Assistant Bosses Tony Heberer, Grover Capps and Harry McLaughlin, and Examiners William Ditterline, D. Alvis, Jettie Harris and J. Bothman. Fire was discovered in the mine by a watchman at 1 a. m. He gave the alarm and the officials and a number of miners went below. They were closing up entries, at 5 a. m., in an effort to confine the fire, when there was an explosion. A dozen men working near the shaft escaped. A rescue team arrived in a short time from Benton and by using smoke helmets were able to reach the bottom of the shaft; but it was 11 o'clock before the first bodies were found. Several hundred men are employed in the mine. Four years ago there was an explosion in the same mine which killed 52 men.

MISSOURI

Macon—The electrical equipment of the new mine of the Home Coal Co. has been installed and the mine will soon be ready for operation.

OKLAHOMA

Poteau—After being shut down for two months to enable the making of repairs, the mine of the Columbia Coal Mining Co., at Witteville, recently resumed operations with a force of 50 men.

Personals

J. I. Boyd on Oct. 1 resigned as purchasing agent of the United Coal Corporation, Pittsburgh, Penn.

W. C. Dodson of Paris, Ky., has taken charge of the Raymond Coal Co., having recently been appointed as manager.

Horace N. Trumbull, advertising manager of the SKF Ball Bearing Co., of Hartford, Conn., has entered the Reserve Officers' Training Camp at New Haven, Conn.

H. C. Steffey, of Akron, Ohio, has been appointed chief clerk to the general superintendent of the United Coal Corporation, with headquarters in the First National Bank Building, Pittsburgh, Penn., to succeed W. W. Oillett, promoted.

George A. Cokely, of Homer City, Penn., who was recently mentioned in these columns as having resigned his position as superintendent of the Tide Coal Mining Co., is still engaged in that capacity with the Tide Coal company. The announcement of his resignation was an error.

W. W. Oillett has been promoted from the position of chief clerk to the general superintendent of the United Coal Corporation, Pittsburgh, Penn., to the position of purchasing agent, succeeding J. I. Boyd, resigned. Mr. Gillett's headquarters will be in the First National Bank Building, Pittsburgh, Penn.

A. C. Emery having resigned as general purchasing agent of Thomas A. Edison, Inc., Orange, N. J., in order to devote his entire time to the Edison International Corporation, **William Dykeman** has, effective Oct. 1, been promoted and will assume the duties of general purchasing agent for the Thomas A. Edison industries.

Robert C. Byler, for nearly four years advertising production man for the SKF Ball Bearing Co. of Hartford, Conn., has been appointed advertising manager of the SKF Administrative Co., of New York City, and will direct the advertising of the SKF Ball Bearing Co., of Hartford the Hess-Bright Manufacturing Co., of Philadelphia, and the Atlas Ball Co., of the same city, all of which are controlled by the SKF Administrative Company.

George Watkins Evans, of Seattle, Wash., has been named a member of the Alaskan Engineering Commission. Mr. Evans is a well known coal-mining engineer, having specialized in that line of work for more than ten years in the Northwest. He has been the Government's representative in that field when investigations were first made of Alaskan coal, and supervised the getting out of the first test lots of the Bering River field for the Navy. In 1906 he surveyed the same field for the Guggenheims, and in 1913 surveyed the Matanuska field. He is the author of several books on coal mining and has been consulting engineer for many of the large coal operators of Washington, Canada and Alaska.

Obituary

Milton M. Baldwell, 44 years of age, who had for several years been connected with the Byrne & Speed Coal Co., of Louisville, Ky., and the Beaver Dam Coal Co., at Beaver Dam, Ky., died at his home in the latter city on Sept. 25.

William H. Bowser, 70 years old, member of the Bowser & Browning Coal Co., of Louisville, Ky., dropped dead of heart disease while standing on the rear platform of a Sixth St. car at Fifth and Main Sts., on Sept. 25. Mr. Bowser and George Avery Browning had been in the coal business at 136 South Sixth St. for a number of years, and at one time were large river coal handlers.

Trade Catalogs

U. S. G. Co.'s Graphite Products. United States Graphite Co., Saginaw, Mich. General Catalog No. 20. Pp. 64, 5½ x 8½ in., illustrated. Contains detailed information relative to lubricating graphite, greases, paints, etc. A group of photomicrographs and an interesting report of an exhaustive test made by the chief engineer of the Inderborough Rapid Transit Co. of New York, are also included.

Type FK-20 Oil Circuit Breakers for Industrial Service. General Electric Co., Schenectady, N. Y. Bulletin 47,433. Pp. 16; 8 x 10½ in.; illustrated. The circuit breakers described and illustrated run up to 300 amp. and 2500 volts, and are intended primarily for use with induction motors in industrial applications. Under proper supervision they may be used in coal mines.

Industrial News

Sunbury, Penn.—The Anthracite Briquetting Co. has filed notice of an increase in its capitalization from $5000 to $150,000, the proceeds to be used, it is understood, for extensions.

Bristol, Va.—The Powell River Co. is said to be considering plans for the installation of a quantity of new mining machinery to practically double the present output of the plant.

New York, N. Y.—The Inter-City Fuel Co. has been incorporated with a capital of $200,00 to deal in fuel. T. L. and W. D. Eyre and J. H. Cullen, 350 Riverside Drive, are the incorporators.

Manchester, Ky.—The Manchester Coal Co. has filed articles of incorporation with a capital of $40,000 to operate coal properties in the Manchester district. Henry Miller, J. W. Lamb and C. W. White are the incorporators.

Ardmore, Okla.—The East Ardmore Coal Co. has filed articles of incorporation with a capital of $90,000 to develop coal properties in the East Ardmore section. J. T. Marrs, J. W. Weeks and W. S. Smith are the incorporators.

Manchester, Ky.—The Bruner Coal Co., recently incorporated, has perfected its organization plans and will commence operations at once on the development of 36 acres of coal lands near Manchester. G. B. Bruner is president.

Clarksville, Tenn.—The Clarksville Ice and Coal Co. has installed a two-ton Autocar equipped with automatic dumping device, for use in its coal department exclusively. This is the first coal truck placed in service in Clarksville.

Evarts, Ky.—The Upper Harlan Coal Co., of Harlan, which recently filed notice of an increase in its capital from $60,000 to $100,000, is planning for the immediate development of about 230 acres of coal properties in the Evarts district.

Charleston, W. Va.—Coal will be mined on Campbells Creek by J. T. Lightner, who is erecting a plant in connection with a mine he is opening where coal will be taken from the Coalburg seam. This new mine will be in operation by Oct. 10.

Wayne, West Va.—The Burke Coal Co., a Cincinnati concern, will operate in Wayne County on a small scale. This company was organized with a capital of $25,000 by A. J. Roberts, U. S. G. Anderson, Kyle Smith, F. C. Gruble and G. Earl.

Buffalo, N. Y.—Eugene J. Henry, formerly Lehigh Valley lake agent at Chicago, has been appointed government supervisor of the Lehigh Valley coal and package freight lake line and lake-and-rail business at eastern lake ports, with headquarters here.

Philadelphia, Penn.—The Fernwood Coal Co. has been incorporated under Delaware laws with a capital of $200,000 to engage in general coal-mining operations. F. B. Hansell, Philadelphia; J. V. Pimm and S. C. Seymour, Camden, N. J., are the incorporators.

Birmingham, Ala.—The DeBardeleben Coal Co. will move its main offices to Sipsey, Ala., where its mines are located. The Empire Coal Co. will also have its head offices at Empire, Ala., where its mines and coke ovens are in operation. Both of these companies have heretofore maintained their general offices in Birmingham.

Wurtland, Ky.—The Wurtland Coal Co. has been incorporated with a capital of $25,000 to operate coal properties in the vicinity of Wurtland. Wayne Calvin, Wurtland, A. F. Lamaster and G. Washington, Russell, Ky., are the principal incorporators.

Big Stone Gap, Va.—The Liberty Coal and Coke Co. has been incorporated with a capital of $1,200,000 to engage in coal-mining operations in the Big Stone Gap district. S. Thurston Dallard and A. C. Stith, both of Louisville, Ky., are the principal incorporators.

Harrisburg, Penn.—Announcement has been made by the Gamble Briquette Co. that a new size of briquette coal has been evolved by its experts, suitable for use in basket grates. The company's products have been in great demand due to the present scarcity of coal.

Pennington, Va.—The Penn-Lee Coal Co., recently incorporated with a capital of $90,000, is planning to commence operations at once on the development of about 125 acres of coal properties in the Pennington Gap section to have a capacity of about 250 tons daily.

Beckley, W. Va.—Progress is being made on the construction of a plant by the Ingram Branch Coal Co. on the Virginian Ry. in Raleigh County for the development of a tract of 3200 acres under lease. C. H. Mead of this city is one of those largely interested in the company.

Pittsburgh, Penn.—The Pittsburgh Coal Co. has disposed of a tract of about 17 acres of property fronting on the Monongahela River at Dravosburg and extending back to Washington Road to the National Tube Co., Pittsburgh, for a consideration said to be in the neighborhood of $100,000.

Fairmont, W. Va.—Operations in Monongalia County on a large scale will be undertaken by the Diamond Coal Co., of Fairmont, which has been organized with a capital of $200,000. Identified with the new corporation are: A. P. Brady, Warder Cresson, H. E. Engle, Henry M. Schrader and H. W. Showalter.

Charleston, W. Va.—The Buffalo-Kanawha Coal Co., recently organized, is planning to commence operations at an early date on the development of approximately 750 acres of coal properties in the Malden district, to have an initial capacity of 200 tons daily. J. W. Johnson is president; G. A. Corson is vice-president.

Morgantown, W. Va.—The Scott's Run Coal Operators' Association, composed of owners of mines in Monongalia County, has taken up the question of an excessive arbitrary freight rate charged on all coal loaded by mines located on the Morgantown & Wheeling Ry. and a committee of seven operators has been appointed to handle this matter.

New York, N. Y.—Exports of coal through the Port of New York during the month of August amounted to 10,460 tons of anthracite, valued at $72,264; 10,149 tons of butuminous, valued at $72,612; and 333 tons of coke, valued at $9032. Of the anthracite, 65,845 tons went to Canada, and of the bituminous, 65,578 tons went to Brazil.

Fairmont, W. Va.—The Dawson-Connellsville Collieries Co. has been formed to take over certain coal lands already under development. The company will carry on operations not only in Marion County but elsewhere in the state, having been capitalized at $120,000 by Carl Riggs, G. C. Wedding, W. M. Kennedy, E. F. Hartley and H. H. Rose.

New York, N. Y.—State Fuel Administrator Cooke has announced the appointment of H. E. Willer as manager of bituminous distribution for the State of New York, and the appointment of D. T. Davis, of Davis, Symmes & Schreiber, 55 Liberty St., as counsel for the State Administration. Mr. Willer succeeds Ellery B. Gordon, who resigned.

Dallas, Tex.—Lignite production and consumption will be given marked impetus in Texas by the reduced freight rates granted for this commodity, as asked by the lignite producers some time ago. Texas produces much lignite which is being used for fuel in the boilers of many industries, such as electric light plants, cotton gins, oil mills, cotton compresses, etc.

Louisville, Ky.—The Smith-Gardner Co., of Louisville, Ky., which up to the present time has been doing a purchasing or jobbing business, is entering the producing field, having recently secured mining property which is being developed in the Straight Creek field near Pineville, Ky. The company expects to start shipments in 30 days with an initial output of about three cars.

Denver, Colo.—Colorado's coal production for the first seven months of 1918 exceeded by 394,559 tons the production for the corresponding period of last year, the total amount from all the mines of the state up to Aug. 1, 1918, being 8,649,467 tons. The latest report shows that in August 1,124,067 tons were produced from the 222 mines in operation, with 13,867 men employed.

Fairmont, W. Va.—Team track loaders of the Fairmont section will soon have an adequate car supply if plans now under consideration mature, as they are expected to. The plan is to change the zone for shipments of box car coal to permit shipment to be made to points in Ohio, Indiana and Pennsylvania. This will permit the loading of empty box cars being returned to the west for shipments of foodstuffs to the eastern ports.

Monterey, Tenn.—The Tennessee Coal Co., recently incorporated with a capital of $100,000, has perfected its organization, and has had plans completed for the immediate development of approximately 2500 acres of coal property in the vicinity of Monterey, to have an initial capacity of about 15 carloads daily. The company has already purchased the entire mining equipment for operation. M. M. Whittaker is president and manager.

Charleston, W. Va.—Fifty thousand dollars will be expended by the Columbia Coal Co. of Charleston, in the development of a bed of coal in Malden District of Kanawha County. The company has an authorized capital of $90,000, having been organized by Charles A. Smith, Herbert Hannigan, S. G. Smith, R. M. Fountain and C. H. Hetzel, all of Charleston. The new company will take coal from the No. 2 gas seam on Campbell's Creek. Permission to install a siding has been granted.

Toledo, Ohio—Considerable activity was shown during the week ending Sept. 28 at the Toledo docks, showing a good movement of coal from Ohio and West Virginia mines to the Northwest. During the week the Toledo & Ohio Central docks loaded 85,000 tons as compared with 73,000 tons during the previous week, making a total of 1,607,000 tons for the season. The Hocking Valley docks loaded 200,638 tons as compared with 190,333 tons the previous week, making a total of 3,687,679 tons for the season.

Springfield, Ill.—The annual report of Evan John, director of the state department of mines and minerals, shows that coal production in Illinois increased 10,995,982 tons in the fiscal year of 1918 as compared with the next previous year. The report shows that a total of 967 coal mines in Illinois produced 89,979,469 tons of coal as compared with 78,933,487 in 1917. The figures are compiled from 370 shipping mines in the state and 597 local mines. A total of 91,372 men were employed in Illinois as compared with 80,893 in the previous year.

Oklahoma City, Okla.—The work of appraising the Indian lands in the Choctaw and Chickasaw Nations of Oklahoma has been completed, and these lands will be offered for sale during October. These lands lie in Pittsburg, Pushmataha, LeFlore, Latimer, Coal, Haskell, Murray, Garvin and Grady counties, and amount to approximately 14,400 acres, of which 6700 acres constitute the surface of unallotted coal and asphalt lands. These coal lands are underlaid with some of the richest coal veins in Oklahoma, as yet wholly undeveloped. All coal and asphalt under the lands of the segregated area is not to be sold with the surface, but is reserved by the Government. All other tracts will be sold without reservation.

New York, N. Y.—Among the contributors to the coal trade allotment to the Fourth Liberty Loan are: Pennsylvania Coal Co. and the Hillside Coal Co., $1,200,000; Madeira, Hill & Co., $160,000; Pennsylvania Coal and Coke Corporation, $110,000; F. A. Potts & Co., $50,000; Lehigh Valley Coal Co., $50,000; Willard, Sutherland & Co., $40,000; Thorne, Neale & Co., $30,000; Burns Bros., $100,000; Mill Creek Coal Co., $60,000; M. F. Burns, $25,000; Vinton Collieries Co., $60,000. Delaware, Lackawanna & Western Coal Co., $1,000,000; Lehigh Valley Coal Sales Co., $1,000,000; Pennsylvania Coal Co., $300,000; Hillside Coal and Iron Co., $100,000; Joseph B. Dickson, $65,000; Jesse L. Eddy, $65,000; Price-Pancoast Coal Co., $60,000, and West End Colliery Co., $60,000.

MARKET DEPARTMENT

Weekly Review

Coal Industry Now on War Basis—With All Demands Known, Fuel Administration Calls for Definite Tonnages of Anthracite and Bituminous—Domestic Demand Urgent, While Bottom Has Dropped Out of Market for Steam Sizes of Anthracite

NO RED-BLOODED American can read of the heroic exploits of our soldier lads across the sea without a thrill of pride. Only yesterday, as it were, a people devoted to peace and following peaceful pursuits, we have converted our plowshares into battle-axes and demonstrated to the disciples of *Kultur* that the spirit of a free nation can surmount all obstacles when it is actuated by high ideals.

To the end that humankind shall continue down the ages unfettered and unshackled, the coal mining industry, in common with other fields of endeavor, has been placed on a war basis. No longer will it be possible for slackers in the mining ranks to lay down on their jobs. The Production Department of the Federal Fuel Administration has divided the coal producing facilities of the country in such a manner that not even one single individual embraced therein will escape questioning if he fails to account for the full measure of the task allotted him.

That a maximum production of coal is an important factor in the war program is a matter of universal knowledge. The necessity for an enlarged supply of bituminous coal is particularly pressing. The Fuel Administration is no longer concerned about the coal situation except as it affects the output of iron and steel needed for munitions and other war purposes. It is either shells or human lives, the lives of our boys at the firing line, and the output required of the soft coal mines between now and Mar. 31, 1919, is 12,234,000 net tons a week. If this average tonnage can be maintained for the next five months, the bunker, naval and other oversea requirements will be met. For the week ended Sept. 28 (the latest statistics available) the production of soft coal was 700,000 tons above the average mentioned, as the total quantity mined during that week was 13,043,000 net tons.

The anthracite mines, too, have been asked to increase production, because of the expanding war program of the nation and to assure adequate supplies of fuel for American industries and American homes. The hard-coal mines are called on to furnish 2,030,000 net tons a week for the next five months. With a shortage of labor already existing in the anthracite regions, it will require strenuous efforts on the part of those engaged in this branch of the industry to meet the call. For the week ended Sept 28 the production of anthracite is estimated at 2,071,000 net tons, which is also well above the quantity demanded.

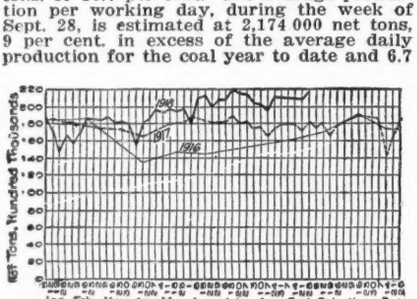
Market conditions, insofar as domestic demand is concerned, are active. The coming of colder weather has witnessed an urgent demand for fuel from household consumers. The influenza epidemic, too, has been responsible for the starting of fires in many homes much earlier than usual, and dealers are being besieged by consumers whose bins are bare of coal. The stove and chestnut sizes of anthracite are in strong demand, and calls for egg coal are also becoming more frequent. The outstanding feature of the market is the collapse in the demand for the steam sizes of anthracite, and several washeries are reported as about to close down for lack of orders.

Cities located near the mines, such as New York and Philadelphia, for example, are receiving only light shipments of anthracite, as a concentrated effort is being made to take care of the outlying sections before winter ties up transportation facilities. Fuel administrators are hopeful, however, that by December every home will have some coal, and dealers in many localities have been notified not to deliver any more coal to those who already have a supply.

It has been definitely decided that the Great Lakes shipping season will be held open until the last possible moment this year, and operators who were rather pessimistic over the outlook for the northwest are now more optimistic. The lake shipments for the season to Oct. 1 are roughly 800,000 to 850,000 tons behind schedule.

WEEKLY COAL PRODUCTION

Bituminous coal production during the week ended Sept. 28 not only exceeded 13,000,000 net tons but also records the third successive week of increased production. The output during the current week (including lignite, and coal made into coke) is estimated at 13,043,000 net tons, an increase over the week preceding of 325,000 net tons or 2.5 per cent., and over the corresponding period of 1917 of 1,863,000 net tons, or 16.7 per cent. The average production per working day, during the week of Sept. 28, is estimated at 2,174 000 net tons, 9 per cent. in excess of the average daily production for the coal year to date and 6.7



per cent. in excess of the average daily requirements during the balance of the coal year to make up the deficit.

During the past six summer months, or the first half of the coal year, production of bituminous coal is estimated at 311,216,000 net tons. This output, which is 33,418,000 net tons, or 12 per cent. in excess of the production during the same period of 1917, falls short of requirements during the current year to date by 10,897,000 net tons, or 3.4 per cent., the increase in requirements this period over the output for the same period last year amounting to 44,315,000 net tons, or approximately 16 per cent.

The production of anthracite in the United States during the week ended Sept. 28 is estimated at 2 071,000 net tons, an increase over the week preceding of 224,000 net tons, or 12.1 per cent., and over the corresponding week of last year of 65,000 net tons, or 3.2 per cent. The average daily production during the current week is estimated at 345,000 net tons as against 338,000 net tons during the coal year to date and as compared with 330.000 net tons during the same period of 1917. Total production from Apr. 1 to Sept. 28 is estimated at 51.651,000 net tons, an increase over 1917 of 1,072,000 net tons, or 2.1 per cent.

Carrier's reports show increased shipments from all districts during the week ended Sept. 28, compared with the week preceding, with the exception of the districts including Cumberland, Piedmont and Somerset, and Tennessee and Kentucky. The decrease in the Cumberland, Piedmont and Somerset district was slight, while Tennessee and Kentucky shipments declined 3.5 per cent. Material improvement occurred in central Pennsylvania, where shipments increased 1653 cars, or 4.5 per cent.; in Northeastern Kentucky and the high volatile and smokeless fields of West Virginia, where shipments increased 927 cars, or 3 2 per cent.; in the district including Illinois, Indiana and western Kentucky, where shipments increased 1955 carloads, or 3.8 per cent.; and the district including Iowa, Texas and Southwest States, where shipments increased 656 carloads, or 4.6 per cent.

Bituminous coal dumped at lake ports (including vessel fuel) during the week ended Sept. 28 is estimated at 1,200.672 net tons, an increase over the preceding week of 7.8 per cent. Compared with the weekly average of the months of July, August and September, the current week's shipments show a gain of 11.7 per cent.

New England shipments of bituminous coal fell considerably during the week ended Sept. 28. Estimates place the total of bituminous coal to New England during this week at 450,766 net tons, a decrease compared with the week preceding of 14.2 per cent. Of this total, rail receipts through the gateways declined 7.1 per cent. compared with the week preceding, the total tidewater shipments 18.1 per cent. A considerable decrease occurred in shipments from all harbors, New York and Philadelphia falling behind 14.8 per cent., Baltimore 9.8 per cent. and Hampton Roads 22.6 per cent. Shipments by rail and from each harbor also fell considerably behind the weekly average during the coal year to date.

Shipments of bituminous coal from tidewater harbors, during the week ended Saturday morning, Sept. 28, are estimated at 916,793 net tons, an increase over the week preceding of 1.8 per cent. All North Atlantic harbors report improvement in the week's shipments, the New York and Philadelphia increase amounting to 4.4 per cent. and the Baltimore increase to 13 8 per cent. Shipments from Hampton Roads declined slightly—1 per cent. Shipments during the week from each harbor also exceeded the weekly average for the coal year to date.

Beehive Coke—Production of beehive coke in the United States during the week ended Sept. 28 was approximately the same as that reported in the week preceding. Preliminary estimates place production during this week at 612,000 net tons as against 614,000 net tons for the week of Sept. 21, the average daily production during each of the two weeks amounting to 102,000 net tons. The operators in the Connellsville, Greensburg and Latrobe districts of Pennsylvania report production during the week ended Sept. 28 at 383,746 net tons, and the operation of their plants at 76.4 per cent. of their full time as against 76.7 per cent. during the week preceding. Operating conditions varied but slightly during the week, yard labor shortage, as in preceding weeks, being the factor which limted production.

CARLOADS OF COAL ORIGINATING ON PRINCIPAL COAL-CARRYING ROADS

	Week Ended Sept. 7	Sept. 14	Sept. 21	Sept. 28
Bituminois shipments, 123 roads	195,367	223,131	223,981*	230,251†
Anthracite shipments, 9 roads	32,234	40,699	36,859	40,524

*Revised from last report. †Subject to revision.

BUSINESS OPINIONS

Marshall Field & Co.—Current wholesale distribution of dry goods is running well ahead of the heavy shipments of the same week in 1917. The volume of road sales for immediate and spring delivery is in excess of the corresponding week of last year. A smaller number of customers was in the market. Collections continue excellent.

Dry Goods Economist—Reports from various sections are to the effect that in department stores the demand for seasonable goods continues good. Collections are excellent and money appears plentiful despite the demand caused by the drive for the Fourth Liberty Loan. Labor appears

more free from unrest due, undoubtedly, to the feeling that the forthcoming draft of young men and those above 31 years old raises questions that must take precedence over all others affecting the working man for the time being.

The Iron Age—Steel output in September with two days less has exceeded that of August. A marked improvement in the quality of coke is reported and some headway is thus being made on the pledge of the trade to increase output 10 per cent. The Carnegie Steel Co. maintained this week its 92 per cent. of furnace capacity in blast last week and its rate of ingot production was 97.8 per cent. against 97.5 per cent. for the previous week. The industry enters October, always a good month, under generally auspicious conditions.

American Wool and Cotton Reporter—The Government has taken up the matter of procuring wool from Australia as the raw material from that market is to be obtained only through negotiation with the British Government. The influenza epidemic has had its effect on the cotton mills, 1600 looms out of 6000 having stopped operations at the Tremont and Suffolk mills because of this disease. Perhaps the one thing of note which has taken place in cotton goods during the past week has been the willingness of manufacturers and merchants to take some business following the announcements that there would be no further determination of prices until Nov. 16.

Bradstreet's—Government work, further adjustments of industry to war-time needs, and the Liberty Loan drive overshadows everything else, but in between these activities a large volume of business on domestic account is passing, three-fourths of the country being supremely active, and, in addition, the glowing news from the war fronts has evoked attention in stock market circles. In the east, however, activities flowing out of the campaign to make the Fourth Liberty Loan preëminently successful have produced a tendency to economize, which hampers business to some extent, while the ravages of influenza have held up trading in important sections of New England, as well as operations at many eastern shipyards and factories.

Atlantic Seaboard

BOSTON

While receipts continue to sag, New England is taking account of stock. Situation easy as to current needs but anxiety over future supplies is evident. Meanwhile buyers show no disposition to order box cars to the extent that might be supposed. The same consignees are most solicitious lest shipments be discontinued through ordinary trade channels. Influenza epidemic spreads to central Pennsylvania. Steel program dominates all other requirements except for bunker and naval use. Hampton Roads situation shows no improvement. The calls of Pocahontas coal moves to other markets. No redress as yet for shippers whose transportation arrangements have to be made in advance of receipts at the piers. Shipments from Baltimore and Philadelphia considerably reduced. Movement on New York's ports not much increased. Connecticut plants better stocked than 30 days ago. Anthracite shows little change. Too early yet to make comment on "free anthracite" shipped to Mr. Storrow's order.

Bituminous—It can now be said that New England industries have practically four months' supply in reserve, although some of the railroads and other large utilities would not make so favorable a showing. The schedule for all-rail shipments has been pretty well maintained as any examination of the figures will disclose. To Oct. 1 actual receipts through the five New England gateways were close to 5,600,000 tons, or about 400,000 tons less than the 60 per cent of the 10,000,000 tons that were to be moved in this direction between Apr. 1 and Oct. 1. By water the receipts have been considerably in arrears. The program called for around 12,000,000 tons for the six months, but actual deliveries were less than 9,000,000. The first half-year closed therefore with a shortage of something over 3,000,000 tons as compared with schedule.

The prospect therefore for shipments from central Pennsylvania the next few months becomes of especial interest; 83.5 per cent. of total all-rail deliveries to New England were scheduled to come from that one district and a brief analysis of receipts from that quarter now has a bearing on the supply available later on. The following table shows how evenly shipments all-rail from central Pennsylvania (wagon-coal not included) have kept up, comparing the week ended July 27 with that ended on Sept. 21:

No. of cars	July 27	Sept. 21
New England railroads..	1130	1361
New England commercial	2506	2308
Total	3636	3669

This, then, for New England is an encouraging showing. During September largely increased requisitions were made for byproduct use, to some extent in central Pensylvania, and yet the movement keeps up with fair regularity. The sag is apparent in other districts, but so far as central Pennsylvania is concerned this tertory has less occasion to worry.

Undeniably the situation is easy here as to current needs. Practically all the industries and power plants are well stocked, and to such extent is this true that buyers are getting particular about quality and the way in which deliveries are made. Among larger buyers, especially those more dependent upon water-borne coal, there is anxiety over future shipments, but yet not enough to make them eager to take what wagon-coal, for instance, is now offering. The 75c. extra for closed equipment is enough to turn the scale.

At Hampton Roads there are still serious cases of over-detention to bottoms waiting for coal for New England. There are today barges which have been two weeks awaiting coal, and meanwhile Government requirements are of course being supplied from day to day. Pocahontas coal, largely because of its low price, is moving very largely to byproduct plants and for coking purposes, while New River is practically free for Government, bunker and for commercial use in New England. For the Pocahontas transshipper who is obliged to arrange for his water transportation considerably in advance there is no redress when his coal is ordered away to other markets. He simply waits patiently for more of his coal to reach the piers, pays the demurrage and either hopes or expects the ultimate consignee eventually to make good the extra expense.

Shipments from Baltimore and from Philadelphia have sloped off to such extent that movement to those piers has been curtailed quite radically. So little coal has been dumped at the Philadelphia piers of late that coal trains have actually been stored in transit on account of yard accumulation. One effect has been a discontinuance of shipments from the mines to that quarter.

Another change is noted in Mr. Storrow's staff at the State House. G. G. Wolkins, who has been bituminous distributor all-rail since Jan. 4, has now returned to his regular work with Hanson & Parker, Ltd., who had given his services. Mr. Wolkins was expecting to continue his efforts through the coming winter, but the New England Fuel Administrator considered it suitable to assign the work to someone else. This change, following so closely on the similar experience of Augustus S. Cobb, who organized for Mr. Storrow the conservation department for New England, has caused comment in the trade. Mr. Cobb was promptly invited to Washington to take charge of the same work for the whole country that previously he had charge of only in New England.

Anthracite—There is little change in the situation on domestic sizes. Shipments are disappointing and retailers grow restive as the season advances. In many towns there are hundreds and thousands of orders on file from householders who have not yet had deliveries of any kind. It is likely that there will be some serious situations to deal with when cold weather sets in.

It is too early yet to comment on the distribution of "Storrow anthracite" which is now coming forward. The fuel authorities who are supervising this distribution certainly have their hands full.

PHILADELPHIA

Anthracite demand heavy due to weather and grip epidemic. Shipments moderate. Improvement promised this month, but dealers doubtful. Yard labor problem grows more serious. New conservation measures effective. No decision on wage problem. Steam coal market slows down. Bituminous up to average of past month or two. Coal well distributed.

Anthracite—Practically all householders got their fires under way this week due to some chilly days which made a little warmth comfortable. Also due to the influenza epidemic, most people who from measures of economy even delay this act until much later in the season, called upon their dealers for at least sufficient coal to get their furnaces going. The fuel administration in order to meet this situation made a ruling that any home where there was a case of the sickness should be served immediately with fuel. However, this extra use of coal was more than offset by the closing of all the schools, theaters, churches and all places given over to public gatherings. Unfortunately, the shipments continue somewhat light locally, although there are a number of the larger dealers who have quite a stock; but every cold day brings hurried calls for it. Stove and chestnut are, as always, in very active demand, with egg also showing considerable life recently. Pea coal is easier than for some time, although the demand during the past few days has been greatly increased.

In the way of shipments it can be said that the largest company shipped less coal to this market during September than any month this year. It is understood that in the same period it increased its shipments to New England almost 100 per cent. and the southern territory, particularly Baltimore and Washington, fared almost as well. This, together with several cold days, made the first week of the current month one of turmoil for both the shipper and dealer. To offset the unfavorable shipping conditions of this company, another of the larger shippers seemed to turn its attention to this market, and for five days shipped as much coal here each day as it had shipped during any one week for several months. This materially helped the situation.

The dealers in the suburbs are promised heavy shipments during October, but at this writing the dealers in the city proper do not know what to expect. It is estimated, however, that real substantial shipments to the rail yards are not to be looked for before November or perhaps December. It is apparently the intention of shippers to complete all obligations to the water yards first.

Probably the outstanding feature of the present market is the collapse in the demand for steam sizes. Commencing with No. 1 buckwheat, on which the Pennsylvania Fuel Administrator some days ago removed for the period of 30 days the necessity for securing exemption orders, down to culm, the demand is less active than for many months. As a representative of one of the large interests here expresses it, buckwheat and rice are free, barley is dead and culm is not salable.. It is understood that several washeries are about to close down for want of orders. The heavier receipts of bituminous have had their effect, also the fact that little has so far been used in the hotels, apartment houses, department stores and office buildings.

The prices per gross ton f.o.b. cars at mines for line shipment and f.o.b. Port Richmond for tide are as follows:

	Line	Tide		Line	Tide
Broken.....	$4.90	$6.25	Buckwheat..	$3.40	$4.45
Egg.....	4.80	6.15	Rice.....	2.90	3.80
Stove.....	5.05	6.40	Boiler.....	2.70	3.70
Nut.....	5.15	6.50	Barley.....	2.40	3.30
Pea.....	3.75	5.00	Culm.....	1.25	2.15

Bituminous—A fair tonnage has been reaching here for the past ten days or two weeks, but it is generally conceded this is much less than the quantity necessary to maintain the plants throughout the coming winter. One thing is certain, however, and that is the tonnage has never been more equitably distributed. The big users, including all utility plants, many of whom have 60 day's supply, are completely shut off for the time being, while the small plants are beginning to exhibit appreciable stocks.

Car supply continues to range between 40 per cent and 65 per cent of working capacity of the mines, with rail movement good, as coal is prompt in reaching market after it is consigned. Shippers continue to urge on rail interests the necessity for a better car allotment, but there still exists a wide variance of opinion between the two as to the necessity.

The trade is still considerably interested in the investigations being made by the administration as to the irregularities in price charged against some of the brokerage houses. With the fining of several recently there are rumors of still other important cases pending.

NEW YORK

Lack of supplies chief complaint of dealers. Dumpings at the local docks show decrease. The trade gets broken coal instead of egg, but do no grumbling. Small sizes become burden and indications point to pooling of these coals. Bituminous situation improves and is in good shape. Bunker coals increase is supply.

Anthracite—Continued lack of supplies is causing much trouble in trade circles.

Dealers here are being hounded for coal, but their only answer lies in the slowness with which shipments are coming to this market. The reports of increased production and shipments do not give much encouragement to the trade here, inasmuch as the Anthracite Committee has recently discontinued deliveries to various communities throughout New England and in this state, indicating that coal has been sent to these places in good volume. Not much consolation can be found in the reports of dumpings at the local docks, which have been showing a gradual decrease week by week and month by month. For the week ending Oct. 4 the cars dumped were 6557, while for the previous week they were 6727. There is therefore a decrease of 170 cars, quite a deficiency when one considers the season of the year. For last month the dumpings were 27,944 cars as compared with 32,494 cars in August, 31,284 cars in July and 30,719 cars in June.

It is likely that the market is still feeling the effects of the suspension in the anthracite fields during the week ending Sept. 21, which resulted in a loss of 11.3 per cent. in production, or 1,847,000 tons produced as compared with 2,088,000 tons the previous week.

There is a steady demand here for all domestic coals. Recently there has been much broken coal sent to dealers who have asked for egg, and most buyers have been asked to take a portion of their shipment in the smaller sizes. This has naturally burdened the retailers with an over-abundance of these sizes, which it is difficult for them to dispose of unless they are able to secure bituminous to sell at the same time.

Some of the docks have been over-stocked with buckwheat and the smaller sizes, with the result that embargoes have been issued several independent producers and shippers. There is a movement on foot to provide for the storing and pooling of these coals, the one obstacle to prevent it being the mixing of the good and bad grades.

Mayor Hylan proposes to have the police repeat their work of last winter by making a house to house canvass for the purpose of obtaining first-hand information as to the amount of coal on hand. This canvass is not to be made until after the finish of the present Liberty Loan Drive.

The State Fuel Administration has fixed the allotment of anthracite for Greater New York at approximately 8,000,000 tons of sizes between broken and pea, inclusive; a trifle over 11 per cent. over the shipments of these sizes in the coal year 1916-1917.

The Brooklyn retail dealers are considering the advisability of inducing customers to have their coal dumped on the sidewalks, the customer to put it into the bins and to receive a reduction of 35c. per ton from the present retail prices. The dealers complain of a lack of help and say they would be enabled to deliver much more coal than at present.

Current quotations, per gross ton, f.o.b. tidewater, at the lower ports are as follows:

Circular	Individual	Circular	Individual
Broken..$6.75	$7.50	Buck... $5.10	$5.90
Egg.... 6.65	7.40	Rice.... 4.65	5.10
Stove... 6.90	7.65	Barley.. 4.15	4.30
Chestnut 7.00	7.75	Boiler.. 4.60	
Pea... 5.50	6.25		

Bituminous—The situation is better than for many weeks. More coal is available and the trade appears to be on easy street. While the local dumpings for the week ending Oct. 4 amounted to only 6666 cars as against 7059 cars the previous week, the demand was not as heavy, due to the fact that shipments to non-essential industrials have been curtailed if not altogether suspended. For the month of September the dumpings were 30 440 cars as against 31,397 for August, 30,372 for July and 31,129 for June.

There has been an increase in bunker coal production, with the result that vessels are being more rapidly coaled and the near-shortage of these coals has disappeared.

Current quotations, based on Government prices at the mines, net ton, f.o.b., tidewater, at the lower ports, are as follows:

	Mine Gross	F.o.b. N. Y. Gross
Central Pennsylvania:		
Mine-Run, prepared or slack...	$3.30	$5.45
Upper Potomac, Cumberland, and Piedmont Fields:		
Run-of-Mine.....	3.08	5.23
Prepared.....	3.36	5.51
Slack.....	2.80	4.95

Quotations at the upper ports are 5c. higher.

BALTIMORE

Continued liberal supply of bituminous here encourages more consumers to take only open-top cars, the result being box-car orders are frequently much over-filled in order to clean up. Hard-coal situation so acute here that Washington decides to make an investigation.

Bituminous—A liberal flow of soft coal is coming in, but much of it cannot be classed as desirable. This easy movement has made the entire market a little soft, with the result that a number of consumers are refusing to take box cars of coal and are willing to live on the small surplusages they have accumulated while waiting for open-car shipments. There have been quite a few reports recently that those willing to take box-car coal have been over-supplied, and that when an order is placed for that kind of coal it has not been infrequent to see it doubled or even trebled in delivery. This is probably due to the fact that for the moment the fuel administration in a number of sections has more loaded box-car coal on its hands for disposal than it has customers, and in order to clean up and prevent confusion is filling all such orders with a more than liberal hand.

Anthracite—The hard-coal situation in this city is serious. Coal men here claim it is worse than in any of the large cities of the eastern seaboard. Estimates have been made by some of the fuel administration officers here that there are 30,000 homes in Baltimore still lacking hard-coal supplies; while many retail coal men say the number exceeds 40,000. The light supplies have prevented any catch-up on the more than 200,000 tons of unfilled orders that have been on the books here for several months, while hundreds of persons are going from dealer to dealer only to be told that they can book no more orders.

A. S. Learoyd, anthracite distributor of the Federal Administration, arrived in the city last Saturday and made a personal investigation of the situation. While it is now rather late to hope to bring full relief, the strong hope is expressed that additional shipments will be sent to Baltimore to prevent real suffering when cold weather sets in.

The following bushel and peck rates have been established for this city by the Maryland Fuel Administration: Prepared sizes, per bushel of 80 lb.—at the yard, 45c.; when delivered to house, 50c. Pea coal, per bushel of 80 lb.—at the yard, 35c.; when delivered at house, 40c.; prepared sizes, per peck, 13c.; pea coal, per peck, 10c.

Lake Markets

PITTSBURGH

Car supplies continue fairly good. Labor insufficient for full operation. New car distribution system causes discussion.

Little if any production is being lost on account of car shortage and output is approximately up to labor supply. Production is short of capacity, but it is a matter of opinion whether the gap between mine capacity and actual production should be ascribed to labor shortage or to car shortage.

The revolutionary method of rating mines for car supply introduced by the Fuel Administration has been much discussed in coal circles. Each operator seems to look upon the change from the personal viewpoint, whether it will operate to the advantage or disadvantage of his own mine. The essence of the new system is that the capacity of the mine is to be determined afresh each month, by making the proportion of its rating to its production equal to proportion between full working time and the time actually worked.

Practice among railroads has not been uniform, various methods having been used in the past. The system of the Pennsylvania was quite complicated and on the whole operators considered it fair. Some roads have been rather careless about their ratings. One feature of the change, affecting but a few mines, is very important, that applying to mines served by more than one road. There have been a few somewhat notorious cases of mines thus located getting a much larger proportion of cars than other mines.

There are practically no open market transactions, nearly all the coal produced going out on contracts or allocations. The national association of coal brokers is making a new drive for membership and desires to include coke brokers. The brokers are doing scarcely any business these days. The market remains quotable at the set limits: Slack, $2.10; mine-run, $2.35; screened, $2.60, per net ton at mine, Pittsburgh district, with 15c. brokerage allowed to be charged by regular brokers to consumers or retail dealers.

BUFFALO

Trying to increase production. Plenty of cars; labor not so certain. Cutting out unnecessary consumers and suspending those with a supply. Anthracite by lake moving as usual, in Buffalo short.

Bituminous—The effort to get out an additional amount of coal is the rule on the part of all producing interests. Some of them are nervous and say that they do not see how the former pace can be kept through October as the men are not eager to come back to the mines with the return of fall weather.

The local situation is somewhat easier, and the issuing to shippers of a long list of consumers who are to be given no coal till further notice merely means that they have a supply and can wait awhile. Of course, they will take in an over-supply if they can get it. Often there comes in a complaint that this or that concern, perhaps a city water-works, is nearly out; but it remains to be reported that anything vital has been left unsupplied.

The jobber still sees his business lagging. He is of the opinion that the Government zonal managers will finally absorb most of the trade left to the jobber and claims that it is fast going now. Meanwhile the bituminous prices are holding as formerly, being $4.65 for Allegheny Valley thin vein, $4.45 for Pittsburgh lump, $4.20 for Pittsburgh mine-run and slack, $5.85 for smithing and smokeless and $5.60 to $6.10 for cannel, all per net ton, f.o.b. Buffalo.

Anthracite—The situation does not change materially. Distributors are sure that the city supply is running down, but wholesalers claim that they have turned over enough of what has come here to keep up the allotment, and a report comes from the state fuel office that every effort is making to provide this county with what has been promised it. At the same time the consumer will never cease to claim that the situation is critical till a good winter's supply has been delivered to everybody.

Lake shipments continue fair, being for the week 109,900 tons, of which 53,000 tons cleared for Duluth and Superior, 22,500 tons for Fort William, 20,500 tons for Milwaukee, 10,000 tons for Chicago, 2900 tons for the Sault, and 1000 tons for Depere. Freight rates continue strong at $1 for Depere and the Sault, 60 to 65c. for Chicago, 55c. for Milwaukee and 48c. for Duluth and Fort William.

TORONTO

Conditions growing very serious. Large number of consumers destitute of fuel. Increasing use of soft coal. Regulations being strictly enforced. Fuel made from garbage and waste material.

The coal situation has become more serious, the setting in of cold weather earlier than usual finding a large percentage of consumers entirely unprepared for the winter. Upwards of 9000 citizens have reported to the City Fuel Controller that they are absolutely without fuel. The more necessitous cases are being supplied as rapidly as possible, delivery of orders to those having partial supplies being suspended in the meantime. Soft coal is being laid in in increasing quantities by those unable to obtain anthracite.

R. Howe Smith, Ontario Fuel Administrator, states that in the allotment of coal originally made to Ontario there was a shortage, as compared with last year, of 400,000 tons of anthracite. With the coming of cold weather and prospective transportation congestion this shortage will possibly be increased to 500,000 tons, which will be most severely felt by the municipalities which have failed to comply with the regulations for the stabilization and distribution of their local supply. Some months ago the Provincial Fuel Administrator requested every municipality to appoint a local fuel administrator, but so far only 160 communities, or 18 per cent. of the total have done so. Circulars were also sent to coal dealers asking that figures be returned showing their requirements based on the consumption of 1916, but this request was in many cases ignored. As a result the Canadian Fuel Controller in his negotiations with Washington, did not take the possible consumption in their communities into his calculations when asking for the Canadian allotment. It is possible that these communities may have to go without coal, and they will certainly have to take a larger proportion of bituminous than the places where the dealers have made an effort to coöperate with the Fuel Administrator. It is imperative that municipalities which have not yet appointed their local fuel controller take immediate action, the intention of the Provincial Fuel Administrator being not to consider requests for relief unless from the local fuel controller.

CLEVELAND

With the exception of the domestic user, the position of every class of coal consumer has improved to a marked extent. Newly formed plans for unloading coal at the head of the Great Lakes have caused some dissatisfaction among operators. The labor situation at the mines constantly is growing more acute, but production has been on the upgrade recently.

Bituminous—Attention of operators in the No. 8 district of southern Ohio is now focused on the labor situation. For some few weeks labor has been going from bad to worse, but the evil has not been so apparent because improved car supply made up for the deficiency. But the point has now been reached, operators say, where they cannot blind themselves to the facts any longer. Cutters, in particular, have become slothful, and in some cases have refused to work more than four hours a day. As a result, some mines are losing from 25 to 30 per cent. of production, and the assistance of the Federal Fuel Administration is being sought.

Just now more coal is going to industrial plants than for the past few weeks, operators say, and stock piles seem as large as ever. The coal that is going to retailers, however, does not average more than 15 to 20 per cent. of their requirements. The extent of the fuel shortage in Ohio this winter depends entirely upon the amount of Ohio coal that is diverted to the East after the lake trade ends, about Dec. 1.

Lake Trade—The mobilization committee in charge of the Great Lakes ship pool this season has announced that in order to expedite the handling of coal cargoes at the head of the lakes all vessels, when possible, will be shifted from the so-called "slow" docks—slow in unloading—to the so-called "fast" docks. This has resulted in considerable dissatisfaction. Some operators assert that the operators who benefit from this step are the ones who made no especial effort early in the season to get their coal up; the efforts of those who dug in will not bring them any special reward, they complain. On the other hand, members of the mobilization committee point out the situation to be as follows: The operators who will be aided by this order are those working gas-coal properties. They had planned last spring, as usual, to send their coal up the lakes, and made no effort to contract for free coal. But the Federal Fuel Administration stepped in and ordered that no gas coal was to be sent to the Northwest. The result was that by the time this ruling was announced other operators had "sewed" up all of the free coal and none was left for the gas-coal men. Hence the need for assistance for them at present. This much, however, is held in common by all lake coal shippers—the iron ore interests more and more are seeking to govern the movement of coal, which is something the coal men feel should be reserved for themselves.

DETROIT

Low temperatures emphasize deficiency of domestic fuel supply. Steam plants find it difficult to replace coal diverted from Ohio, Kentucky and West Virginia. Lake movement is heavy.

Bituminous—Steam-coal users deprived of supply from mines in the West Virginia, Kentucky and Ohio districts by the recent orders of the Federal Fuel Administration in modification of zone restrictions, are experiencing some difficulty in obtaining substitute fuel. Complaint is made that the mines in Illinois are not filling orders promptly and seem unable to handle the increased business allotted them, in a manner satisfactory to the buyers. The coal sent from the Illinois and Indiana mines is pronounced inferior to that which the Detroit industrial plants heretofore have been using, though with the freight charge added its cost is practically the same as for the more desirable southern coal. A number of the large manufacturing plants, working on Government orders, are reported to be supplying their current requirements by drawing on reserve stocks that were intended to tide them over winter emergencies or interruptions of supply.

Jobbers assert that the modified zone regulation is not proving as helpful in adding to stocks of domestic consumers as was expected. The prepared sizes, they say, are being rushed to the lakes for shipment over the routes favored by priority order, rather than over the all-rail route to Detroit. Business of the jobbers is cut deeply by the changed zone regulation, as the only market left them for southern coal in the lower peninsula of Michigan comprises railroads, byproduct and gas plants, and domestic trade. With stock suitable for domestic use arriving in only moderate amount, and buying by railroads, gas works and byproduct plants not large in volume, the jobbers are getting slim picking.

Anthracite—Cold rains and low temperature have brought an insistent demand from domestic consumers seeking anthracite. The deficient supply and restrictions giving priority to base-burner owners on delivery of chestnut and stove sizes combine in balking efforts of many of the would-be buyers. Homes dependent on hot air furnaces are required to have put in an amount of bituminous equal to one-half their winter fuel needs before they can receive any anthracite.

COLUMBUS

The steam trade is not as overstocked as a week ago because of further modifications of the embargo against shipping screenings into Michigan. There is a continued good demand for domestic and lake tonnage.

The steam situation has been relieved to a certain extent because of modifications to the embargo against shipping small sizes into Michigan, and there is not so large a stock on the local market. In addition certain steam plants have been stocking up steadily, and many have a supply of from three to four months. Railroads are still taking a large tonnage as the freight movement continues extra heavy. Schools and hospitals have been supplied, and the same is true of public institutions. On the whole, the steam trade is running along in a more normal channel.

The domestic trade is one of the strongest points in the market. There is a considerable tonnage moving from mines into yards, partly to take care of current business and partly be used in stocking up for the future. Retail stocks are gradually getting larger. One of the worst features is the fact that lump is rather scarce, while there is an ample supply of mine-run. Retailers are fairly busy making deliveries. It is estimated that about 75 per cent. of domestic coal in this section has been stocked by the consumers.

The lake trade is also active and considerable attention is now being devoted to that branch of the industry. The vessel movement is generally efficient and little delay is experienced either in loading or unloading. The ore movement is also good and consequently the coal trade is stimulated. The movement off the docks to interior points in the Northwest is rapid and no congestion is reported.

CINCINNATI

Volume of business is high, with good movement from the mines and good local supplies on hand. Question of future industrial consumption is the chief cause for worry.

The excellent state of the local situation, both for domestic and individual consumers, may be gathered from the fact that the former, as a rule, have their winter's supply, or at least half of it, already in their basements, while the latter, wherever storage is available, usually have several months' supply stored. These is at least one large coal concern, with operating connections, which has been advertising for orders from industrial consumers, assuring them that it has ample coal to take care of all orders. The movement of coal from eastern Kentucky and West Virginia continues at a heavy rate, and with shipments by river being aided regularly by artificial rises brought about by means of the Government dams, Cincinnati is assured of a regular supply of coal. Whether this will be sufficient, with the constantly increasing consumption both locally and to the North for heating purposes, as the season advances, is another question. The peak of industrial consumption, of course, is also ahead, and as the average industrial consumer, unfortunately, cannot possibly store enough coal to last for more than a week or so, maintenance of the present movement, and its increase, if possible, are just as necessary as elsewhere. However, the general feeling among the trade, and among the authorities in charge of the fuel situation, is distinctly optimistic, and while this is based largely on the extent to which the public at large, including domestic consumers principally, has been induced to store its winter supply of coal, it also has regard to the prospects for taking care of the industrial situation in good shape.

LOUISVILLE

Local conditions reflect a general shortage of lump coal for domestic use, with mine-run and screenings in plentiful supply, and the market a little draggy on such coal. Car supply much better at mines, labor supply slightly easier and production on upgrade.

Conditions in the Louisville market are about the same as they were last week, with the exception that there is a still greater surplus of mine-run and screenings, which are not selling readily. Industrial plants appear to be well stocked and under regulations of the Fuel Administration are not buying freely. Jobbers and producers are meeting with some little trouble just now in disposing of steam grades, although there is an active demand for domestic or lump coal for stocking purposes. Most of the stocking at this time is in small lots, of one to four tons, except on eastern Kentucky coal, where many consumers have been waiting for deliveries.

Yards are laying up practically no surplus of lump coal, being unable to secure enough for requirements. A little mine-run is being stocked by some companies for emergencies, as they want to secure surplus stocks of some sort, and can not secure lump. Industrial consumption is taking more mine-run at this time than screenings, due to the fact that it stocks better, and is even easier to obtain than screenings as many producers are not screening at this time.

BIRMINGHAM

No marked change in Birmingham market. Steam demand easy in tone but of satisfactory volume, while domestic trade is strong and the supply short. Production slightly lower than the previous week. Car supply fairly good.

Reports in trade circles indicate a good, steady demand for steam coal, but the situation is devoid of any tenseness. The rail lines are taking coal on about the same basis as observed for several weeks past, the supply with some roads, however is said to be very short and fuel agents have been in the market lately to secure additional tonnage. There is practically no free coal available at present.

Domestic dealers still have many unfilled orders on file and new ones are being received about as rapidly as deliveries are made on old ones. The production of lump coal is short of requirements and a great deal of mine-run coal is being stocked for domestic use.

The output of coal in this district for the week ended Sept. 21 was 382,000 net tons, or about 50,000 tons short of the maximum weekly production record of two months ago. The loss is attributable to irregular work and shortage of labor, the car supply having been fairly good and little, if any, interruption was caused by lack of equipment. The production committees of the fuel administration are now fully organized and at work, and it is to be hoped they will be successful in bettering the production materially.

Coke

CONNELLSVILLE

Coke quality improving. Byproduct supplies maintained with difficulty. Heavier Connellsville coal shipments.

Blast furnaces in increasing number are reporting a visible improvement in the quality of coke received, but as a rule those who have had cause for complaint feel that there is still much more to be done. Pig-iron production has been at an increasing rate, but as output always increases at this season of the year, on account of decreased atmospheric humidity, it is impossible to trace directly the influence of improvement in coke quality upon blast furnace operations. As has been the case for some time past, there is only occasional shortage of coke, in point of actual tonnage. Furnaces would like to have more coke, however, as it is desirable to accumulate a reserve against winter conditions. Very little coke has been in stock at any furnace.

The Fuel Administration continues to watch closely the amount of coke offered as foundry grade, and requires that this be kept down to the actual needs of foundries engaged in war work, all other coke to be offered as furnace no matter if it has been in the oven 72 hours. These regulations have been helping the furnace coke supply for some time past.

The Fuel Administration has thus far had little success in finding byproduct coal to ship to byproduct ovens that have been receiving Connellsville coal, for the purpose of allowing the Connellsville coal to stay in the region and be coked in beehive ovens. The ruling made some time ago that beehive ovens must not be blown out promptly became practically a dead letter as it was impossible to observe it except at the expense of depriving byproduct ovens of coal, and a full supply to them is essential on account of the byproducts. There

is no prospect of any early improvement continued nearly if not quite to the end in this respect, as lake shipments are to be of the navigation season. Afterward there may be coal that can be diverted to by-product ovens to relieve Connellsville coal shipments.

The market is quiet and remains quotable at the set limits: Furnace, $6; foundry, 72-hour selected, $7; crushed, over 3-in., $7.30; clean screenings from old dumps, over ½-in., $5.50, all per net ton at ovens. Some minor screening operations have dropped out since the price limit was reduced to $5.50, apparently because too much labor was involved in the operation, but there is still considerable marketing of this material, for household purposes.

The "Courier" reports coke production in the Connellsville and Lower Connellsville region in the week ended Sept. 28 at 335,195 tons, a decrease of 4280 tons, and coal shipments at 245,136 tons, an increase of 22,733 tons.

GENERAL REVIEW

Mines producing more coal than territory can absorb. Steam market soft, as all large manufacturers have plenty of storage coal in reserve.

The mines in the Middle West are continuing to produce record tonnages, as the car supply is good, the labor situation favorable, and there are no serious storms to tie up traffic or cripple individual operations.

The coal market continues soft and, as has been the case for the whole month of September, the mines have produced more coal than the territory can easily absorb. The Fuel Administration has taken steps to alleviate this state of affairs, and it is now definitely announced that Illinois and Indiana coals are to continue to move into the lower peninsula of Michigan. Michigan, by the way, is no longer suffering for coal, and both Indiana and Illinois sales agents are having increasing difficulties in placing orders in that state.

A second step, and one which will relieve the situation to a certain extent, has been recently promulgated. Railroads doing business in Indiana, who have hitherto been purchasing their fuel in either Ohio or Pennsylvania, have been ordered to buy their coal from Indiana operators. This has proved an extremely wise measure, as it has tended to relieve some pressure from the East, where we understand there is an increasingly serious shortage, and at the same time has helped conditions in the Middle West, where the market is weak and needs strengthening.

Some of the largest producers in this territory are freely predicting a soft market on steam coal to continue throughout the winter season. They base their predictions on the fact that practically all the big manufacturers have in stock at the present time enough coal to last them from two to four months.

CHICAGO

Steam coals offered freely. Railroad purchases large. Screenings are selling at substantial reductions.

Conditions in the Chicago coal market differ little from the general situation in the Middle West territory. Nearly all steam coals are offered freely, and only a few of the better known and higher grade products are being sold on a basis of Government price. The mine-run situation is improved slightly, owing to large purchases on the part of the railroads, but screening sizes are to be had at substantial reductions.

The domestic market is a little better off, as the recent cold weather, combined with the Spanish influenza scare, has caused the domestic user to burn some coal to keep his place warm, and whenever possible he has bought additional fuel, rather than start in on the coal he has reserved for the winter.

MILWAUKEE

Fuel administration's schedule of prices for anthracite questioned by dealers. Threats of refunds if overcharges are made. Measures of conservation.

Before leaving for Washington, where he will endeavor to have Wisconsin's allotment of coal increased, State Fuel Administrator caused the following schedule of prices for anthracite to be promulgated: "Under date of June 24, the United States fuel administration established the prices of anthracite coal f.o.b. cars at the docks on the coal which left the mines prior to June 25, as follows: Egg, $8.35; stove, $8.57; nut, $8.66; pea, $ .19. On anthracite coal leaving the mines on and after June 25 there is an addition of 40c. per ton to the above prices f.o.b. cars at the docks, made necessary by the advance in freight rates from the mines to Lake Erie ports. During the summer there was a voluntary reduction of 30c. per ton on anthracite coal as an inducement for people to order and take in their coal early, if it was available. This voluntary reduction expired Sept. 1, and after that date 30c. per ton was added to the price. At the present time the prices f.o.b. cars at docks are: egg, $9.05; stove, $9.27; nut, $9.36; pea, $7.89. To these prices should be added $2.25 per gross ton which covers all expense of retailing and delivering such coal to the consumers' curb, the prices for curb delivery being as follows: Egg, $11.30; stove, $11.52; nut, $11.61; pea, $10.14. These are the maximum prices prevailing in the city of Milwaukee on coal handled by all the large dock companies." The consumer pays an additional 70c. per ton for carrying the coal from curb to bin. The fuel administrator threatens to impose refunds wherever overcharge from the above rates are discovered.

Retailers are somewhat puzzled over the latest order, as it is at variance with the prices they have been permitted to charge following the conditions noted in the fuel commissioners' detail, and there is a disposition to await Mr. Fitzgerald's return before making any change.

Coal receipts at Milwaukee by lake during the month of September foot up 96,451 tons of anthracite and 631,775 tons of bituminous, making the receipts during the season of navigation thus far 461,428 tons of the former and 2,778,187 tons of the latter. There are about 10 weeks of lake navigation still ahead.

ST. LOUIS

A continued easy market, with a surplus of all coal, excepting Carterville. Steam and domestic demand light. Car supply good and transportation improved.

The St. Louis market is an easy one. It is hard to find a place for some sizes of coal from the Standard and Mt. Olive fields. Car supply has shown improvement during the past week and transportation continues better.

In view of the fact that between 75 per cent. and 85 per cent. of the domestic tonnage usually stored by December has now been delivered, the market will continue easy for domestic coal from this time on, with the exception of Carterville. There is still a shortage on that locally, not only for domestic but also for steam. The domestic demand from the country has eased up in the past week and the same pertains to steam sizes.

A good railroad tonnage moves in from all the fields, and this is the only thing that is saving the southern Illinois market at the present time. In the Carterville field cars are not so plentiful as the operators would like, but the service rendered is good in comparison with the past. Some mines are catching up on orders. A large tonnage continues to go on Government requisitions, and the railroads are still pulling heavily. Labor and other conditions are about normal under existing circumstances. In the Duquoin field there is little change. The Mt. Olive district still produces more coal than it can find a ready market for. Car supply here is good, and in a general way this field is a satisfactory one to the operator. Labor is good and cars plentiful. The Standard field presents the same old problem of overproduction. The distribution of cars has shown some improvement here, and transportation facilities have also developed better in the last few weeks. There is, however, unbilled coal in this field nearly every night on all sizes. One of the problems in this field that has not been regulated is the taking over by the Government of certain short-line roads that openly discriminate in the distribution of cars, leaving some mines idle and working other mines full. No eastern fuels are moving into this market and very little from Arkansas.

The prevailing market per net ton f.o.b. mines is:

	Williamson and Franklin County	Mt. Olive and Staunton	Standard
6-in. lump..	$2.55@2.75	$2.55@2.75	$2.40@2.70
3x6-in. egg..	2.55@2.75	2.55@2.75	2.40@2.70
2x3-in. nut.	2.55@2.75	2.55@2.75	2.40@2.70
Washed:			
No. 1.....	3.05@3.20	3.05@3.20	.....
No. 2.....	3.05@3.20	3.05@3.20	.....
No. 3.....	3.05@3.20	3.05@3.20	.....
Mine Run..	2.35@2.50	2.35@2.50	2.20@2.30
Screenings..	2.17@2.32	2.17@2.32	1.50@1.60

Special preparation on Carterville is 10 cents extra.
Williamson & Franklin Co. rate is $1.10.
Other fields 95 cents.

KANSAS CITY

Retail prices increased after investigation of costs of doing business. Labor and miscellaneous items show increased cost.

The state and local fuel administrations gave to Kansas City, Mo., coal dealers, effective Oct. 1, an increase in retail prices of about 30c. a ton on bituminous and 45c. on semi-anthracite coal. Further increase will be established Jan. 1, 1919, of 25c. on bituminous and 10c. on semi-anthracite. The advances allowed on anthracite range from 5 to 80 cents.

The advance was the direct result of a report made by Gregg & Co., accountants of St. Louis, who made an investigation of local costs of doing business, at the instance of the retail dealers of Kansas City. The fuel administration had indicated that it would try to fix such prices as would allow a net profit of about 35c. per ton. The report of Gregg & Co. showed that dealers were not receiving this profit. The report made plain the fact that no absolute guide to a proper level of prices could be established now, since prices paid by coal dealers for various costs of operation were changing rapidly. For instance, dealers raised their teamsters from 30 to 35c. an hour recently; truck drivers are asking an increase from 35 to 40c. Unloading wages were formerly 5 to 15c.; now the range is 15 to 30c. Hay cost $31 a ton a year ago, now it is $40—with prospect of early advance. In view of the advancing costs of doing business, the fuel administration granted the increase in retail coal prices, though not as large an increase as the dealers hoped for, or as the report of the accountants indicated would be just.

The state fuel administrator, Wallace Crossley, in an interview announcing the advance to the public, remarked that the dealers had been operating on too narrow a margin.

SEATTLE

Secretary of Fuel Administration says domestic fuel situation is worse in Northwest than any other section of the country and predicts closed industries as war necessity.

The domestic coal situation is worse in the Northwest than any other place in the United States, according to David Whitcomb, executive secretary of the Fuel Administration of Washington, D. C., who is in Seattle while arranging for the departure of his family for Washington. Whitcomb was formerly fuel administrator for this state. Shortage of labor and the small demand for industrial coal in the Northwest are the reasons advanced for the domestic coal shortage, according to Whitcomb. Domestic coal for home consumption is usually the large lump coal. The fine coal has a small market in the Northwest, and it is impossible to mine the larger lump coal when there is no market for the fine coal which is mined at the same time. Some industrial curtailment of fuel will be made in this section this winter, he reports, as well as in certain parts of the Middle West and East.

The problem of the administration at this time, he states, will be to draw the line between essential and non-essential industrial plants and close down the latter as a war time necessity next year. He declares that people who complain of the scarcity and price of coal do not realize that the United States is the only country which has increased its coal tonnage since entering the world war. The domestic consumers of the Northwest will have to use pea coal or do without, is the opinion of coal operators of this section, who state that this class of fuel is in abundance.

General Statistics

NORFOLK & WESTERN

A statement of coal tonnage from mines on the Norfolk & Western R.R. and from other railroads, for the month of August, 1918, is as follows:

From:	Net Tons
Pocahontas field	1,470,411
Tug River field	316,574
Thacker field	295,868
Kenova field	125,057
Clinch Valley field	174,015
Other Northern and Western fields	16,594
Total Northern and Western fields	2,398,492
Williamson & Pond Creek R.R.	214,843
Tug River & Kentucky R.R.	66,697
All other railroads	96,663
Grand total	2,776,695